

# THIS WEEK IN THE IRON AGE

Vol. 158, No. 4

July 25, 1946

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Bars of A4615, like all Ryerson Alloys, are unmistakably identified by color marking and heat symbol. When transferred to the Ryerson Alloy Report, marking and symbol give a positive check between steel and accompanying hardenability data.



## Now Back in Ryerson Stocks

### A4615-A4140-A4150 and other prewar alloys

Old friends, the alloy steels for which Ryerson stocks were distinguished in the days before Pearl Harbor, are back from war. They have been at the front for more than four years but now their special war jobs are finished and these steels are again available to everyone for prompt shipment from eleven Ryerson plants.

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## Seek the Truth

THE Bible has always been one of the "best sellers" and for several good reasons. One of them is that there are so many kernels of wisdom, succinctly expressed, contained between its covers.

St. Paul, for example, said a "mouthful", as the slang expression goes, in ten words. In them he expressed the basic approach to research of every description. His precept, "Seek the truth and the truth shall make you free," has been followed by every scholar, inventor and scientist from Copernicus down, or perhaps I might better say up to "Boss" Kettering.

"Ket" wants to know why grass and other vegetation are green. He believes that the answer to this, which nobody yet knows, may open up a new vista of solar energy utilization possibly more important to us than atomic fission.

Seeking the truth, or objective research, as it has been successfully pursued over the centuries, has been widely beneficial to mankind. Its findings have not been monopolized but have been spread across the boards.

Seeking the truth objectively, and unselfishly, gave humanity antiseptics, through Lister, anesthesia through Morgan and the X ray through Madame Curie. How much these results of seeking the truth have reduced and relieved man's conflict with disease will never be measured.

Now comes the necessity of discovering the truth that will lessen man's conflict with man. The truth about economics.

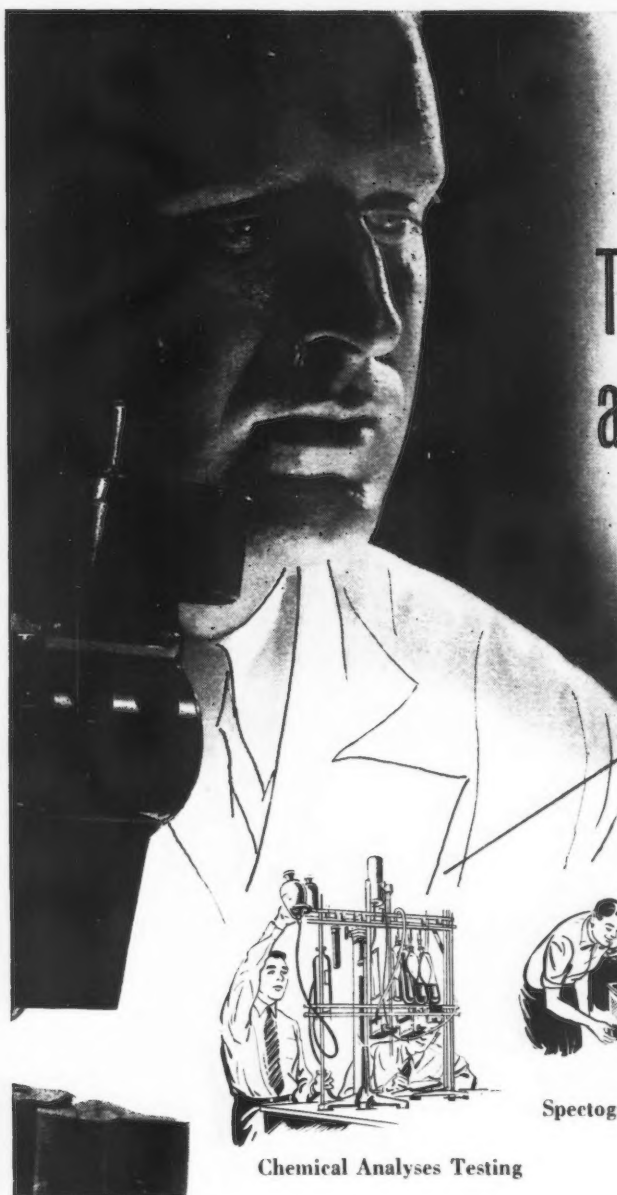
My firm belief is that nine tenths, at least, of the conflict between capital and labor, nine tenths of the failure of collective bargaining, and nine tenths of the ill-considered and executed social legislation are due almost entirely to our abysmal ignorance of economic fundamentals.

Certainly all could write on "more for everybody" if we could know the way to get it. One thing that we are beginning to find out is that political promises, under whatever ideology or party they are issued, won't bring it to us, any more than the "medicine man" and his bottle of colored water could bring a cure for cancer.

We must seek the economic truths that will set us free on the path of more for everybody. Certainly the path does not lie in the direction of closed plants or of closed minds.

I am glad that the Committee for Economic Development has put its hand to the plow in the endeavor to uncover the economic facts underlying "more for everybody." It is a gigantic job but the best brains in America; in economics, in labor and in management, are back of it. Every man, woman and child has a stake in this search for truth that we hope will set and keep us free.

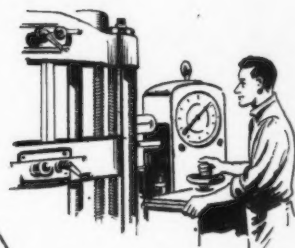




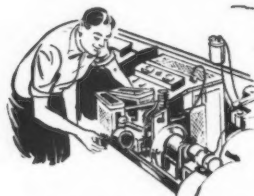
## The Trained Eyes at Inland—



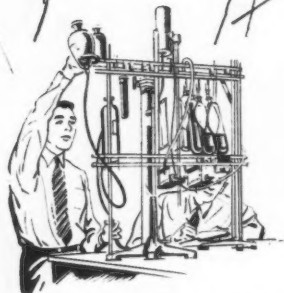
Optical Pyrometer Temperature Testing



Tensile Strength Testing



Spectrophotographic Test for Elements



Chemical Analyses Testing

Every day, year in and year out, ton after ton of steel passes the scrutiny of Inland's "trained eyes" . . . Samples are gathered from all operations and subjected to exacting tests before the steel is permitted to be rolled into final form.

Chemical analysis maintains a careful control over all elements . . . holds them in proper proportion and within rigid tolerances. Further control is possible by means of the spectrophotometer and the comparator, that present a graphic record of the exact composition. Optical Pyrometers eliminate guesswork . . . allow operators to control temperatures

accurately at all times. In addition, tensile, hardness and metallographic tests are conducted to maintain satisfactory properties. The combined control exerted by these tests is assurance of the quality fabricators can expect . . . and get from Inland Steels.

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# INLAND STEEL

► The desperate nature of the motor car parts bottleneck is illustrated by the fact that one maker paid a \$15 a ton premium for pig iron, another processed war surplus armor plate for bumpers and in a third case substitute wooden bumpers will cost \$20, including tooling cost on the brackets.

► In a sharp break with railroad tradition one of the country's leading car builders has designed a box car itself instead of building to railroad specifications. Payload of the new car will be at least 5 tons greater than that of old style cars due to new design and the use of high tensile low alloy steels.

► The only delivery data kept by many steel mill sales offices is how many months they are behind on what mills. With certified priorities complicating the picture it would take two crystal balls and a yogi to arrive at an approximate delivery date on any given order.

► Army Air Forces, taking no chances on being caught off-base in an emergency, are taking steps to cut down time required for tooling up (now averaging 9 months) should an emergency require rapid expansion of aircraft production.

Present plans call for standby storage of approximately 35,000 selected general purpose machine tools; cost of storage-maintenance will be slightly more than \$2 per tool or about \$80,000 annually.

► Lack of suitable government statistics on wages-employment is proving a serious obstacle to the OWMR search for a guaranteed wage plan suitable for industry-wide application; the Latimer study group may have to settle for plans applicable to regional levels.

The 275 plans, screened from about 1500 reported by private business, selected by the group as worthy of additional study have now been further reduced to about 60.

► Overseas surplus declarations by the Army amount to about \$3.4 billion. Additional declarations totaling \$2.1 billion are expected before the overseas job is wound up.

► A useful aid in determining the type of adherence of various electrodeposited finishes is X-Ray diffraction. It is nondestructive and the same specimen may be repeatedly checked to detect changes resulting, for example, from aging or heating.

► Of particular interest to investigators of centrifugal casting in Germany was the use of the thin sand mold, that is clean silica sand was spun in the mold just before casting steel gun barrels. Although there is some penetration of the sand by the molten steel, the sand comes off very readily in the subsequent heat treatment.

► While the Chinese government has expressed interest in buying \$3½ billion worth of surplus property on Okinawa lack of transportation is holding up the deal. Not more than three piers are available on the island, and the property movement would be extremely slow with such limited facilities.

► OWMR has recommended that an effort be made to interest American firms in the purchase of surplus aircraft overseas provided they would assume the cost of tearing them down and transportation to this country.

► According to a recent National Labor Relations Board ruling in a General Motors case, a company may not tell a foreman that he must either resign from a foreman's union or lose his supervisory position. Such action was held to be discriminatory.

► To measure the effect of projectiles on armor plate German scientists developed a high speed spark type camera capable of taking 24 pictures on a glass plate at the rate of 500,000 frames per sec.

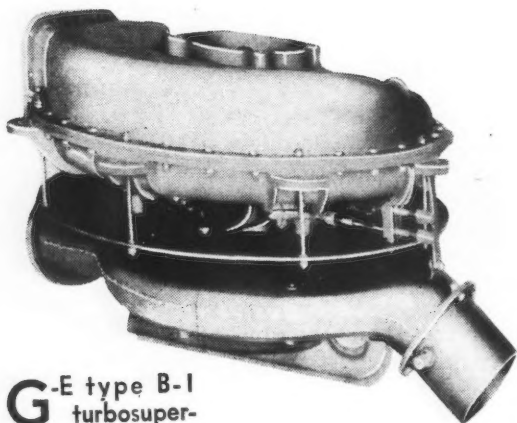
► Fractional horsepower motor production hit a new postwar high in May when 1,653,744 units were manufactured.

► The central iron and steel sales bureau of Britain's nationalized steel industry is negotiating an agreement to export some 30,000 tons of steel to Russia. Another 20,000 tons are slated to go through the iron curtain into Bulgaria.

► France had planned to import from 220,000 to 275,000 tons of steel products each month this year but actual receipts have averaged only about 55,000 tons monthly since the beginning of 1946. The recent loan agreement with America is not expected to permit large imports of steel products from the United States. However, there are about 300,000 tons of steel involved in French orders for 20-ton freight cars.

► Italian steel production now approximates 58,000 tons per month, about equally divided between openhearth and electric furnace. This represents about 25 pct of installed capacity.

# Metallurgical Development of Materials for



**G-E type B-1**  
turbosuper-  
charger.

THE supercharger metallurgist has the simple problem of recommending and obtaining materials suitable to withstand the temperatures and stresses conceived by the designing engineer. He also has the ever present demand to produce materials with improved properties so that superchargers may be designed with even less weight and increased altitude rating.

The supercharger wheel is exposed to temperatures in some instances approaching 1300°F at the rim and 500° to 600°F at the center. The design stresses at and near the center demand a material with a high yield strength, about 80,000 psi at 600°F. The rim stresses demand a material with high rupture strength at 1200°F. In addition, the wheel material must be readily forgeable, machinable and made of alloys

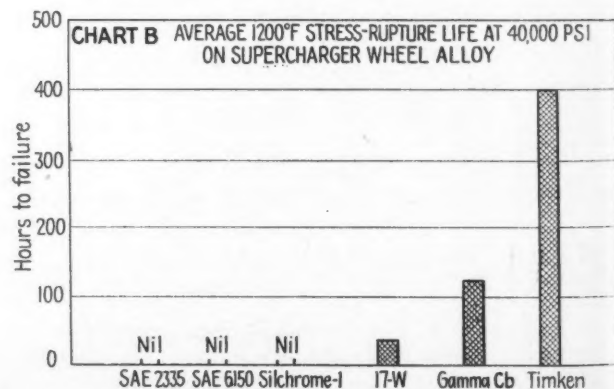
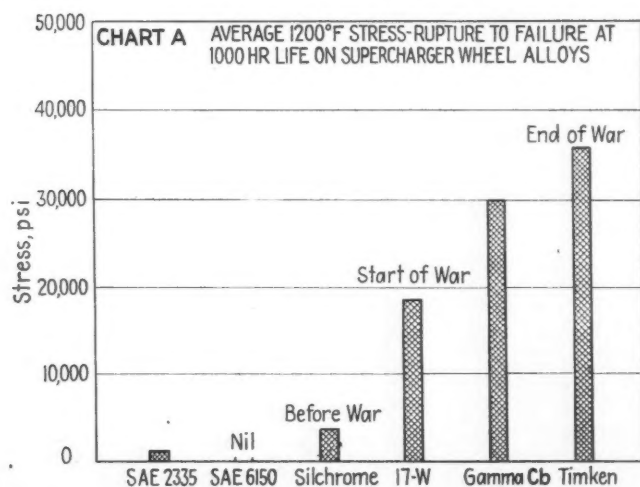
By **W. L. BADGER**  
In Charge, Metallurgical Section, Thomson Laboratory  
General Electric Co., Lynn, Mass.

which are available in the quantities required. The composition must be such that it will not become excessively brittle due to aging in operation, and will resist oxidation of exhaust gases. It must be readily weldable. It can be seen that there are not many alloys capable of fulfilling all of the above requirements.

The high temperature properties of wheel and bucket materials in the earlier days of the supercharger were made by comparing short time tensile tests at various elevated temperatures. More recently the rupture test has largely replaced this test. The rupture test is made by suspending a series of loads on test bars in a furnace and determining the length of time in hours before failure occurs. The results are then plotted on log-log paper, as will be shown in accompanying illustrations.

All wheel and bucket materials are given a corrosion test, wherein they are exposed to exhaust gases containing tetraethyl lead decomposition products at their operating temperatures for a specified time, and the oxidation loss in milligrams determined. These tests

FIG. 1 — Graph D (Right) gives the 1200°F stress rupture-life of various supercharger wheel materials used to date. Chart A shows the comparative 1000-hr life of wheel materials at 1200°F. Chart B illustrates the 1200°F stress rupture life of wheel mate-



# Turbosuperchargers and Aircraft Gas Turbines

**The metallurgical development of alloys suitable for the severe high temperature service requirements of aircraft turbosuperchargers, from the SAEs 2335 and 6150 up to the present day Timken and Vitallium alloys, is described in this, the first part of a two-part article. The improvement in stress rupture values of wheel material and bucket alloys over the past quarter century is graphically illustrated and the author, speaking with acknowledged authority, discusses some of the other metallurgical headaches which plagued the development of the supercharger. The second part, to be published next week, will cover material used in aircraft gas turbines.**

All prospective wheel materials are spun unbucketed to failure in a high-speed vacuum stand, and the maximum rpm is recorded. Bucketed wheels are then run at gas temperatures up to 1700°F for periods of 150 hr or more, at substantially above-normal rated speeds, before new materials are accepted.

In the last 10 yr, laboratory tests have been made of literally thousands of prospective wheel and bucket alloys. Many of these have been cast, forged and tested at Lynn River works and many more by our steel suppliers. The Schenectady works have also made extensive tests of these materials. Rupture tests are being made in the Lynn works alone at the rate of approximately 400 materials per year. In spite of the number tested, the number of materials suitable for supercharger wheels can be counted on one hand.

Recently all production wheels have been made as contour forgings, reducing substantially the amount of machine work on the forging. The adoption of

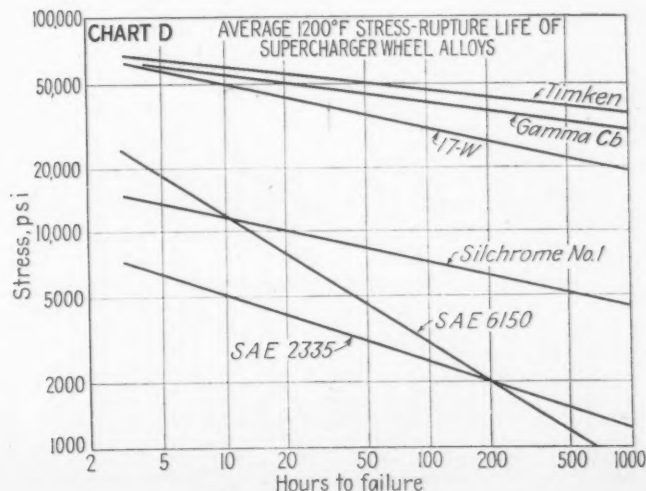
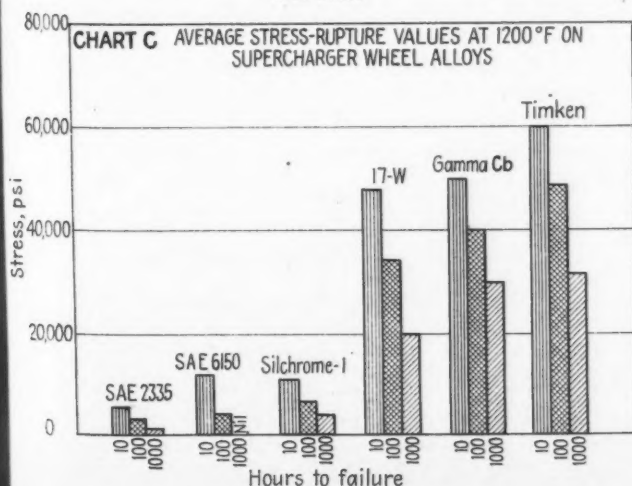
contour forgings has substantially decreased the amount of strategic materials used. This change in forging method has at the same time resulted in improved grain refinement and a wheel which can be run at greater speeds. Wheel materials which have been used over the past 25 yr are listed, together with approximate chemical analyses, in table I. Fig. 1 illustrates graphically the progress made over the past 25 yr in improving the performance of supercharger wheel alloys. It will be noted that Timken alloy<sup>1</sup>, under a load of 30,000 psi, will last 3000 hr as compared with 115 hr for 17W materials. Micros of several typical wheel alloys are shown in fig. 2.

The selection of bucket alloys is based largely on the rupture strength at 1500°F. It is an obvious fact that as the rupture strength increases, the forgeability

<sup>1</sup> See "16 25-6 Alloy for Gas Turbines," THE IRON AGE, Jan. 17 and 24, 1946.

usually decreases, since the same alloys that increase rupture strength decrease the forgeability. For this reason General Electric has recently turned to cast-are made with various air-gas ratios, and recent tests have been made under stress.

rials under a stress of 40,000 psi, while Chart C gives 1200°F rupture results for 10, 100 and 1000-hr rupture strength plotted on coordinate paper and shows rapid fall-off of rupture strength with time.



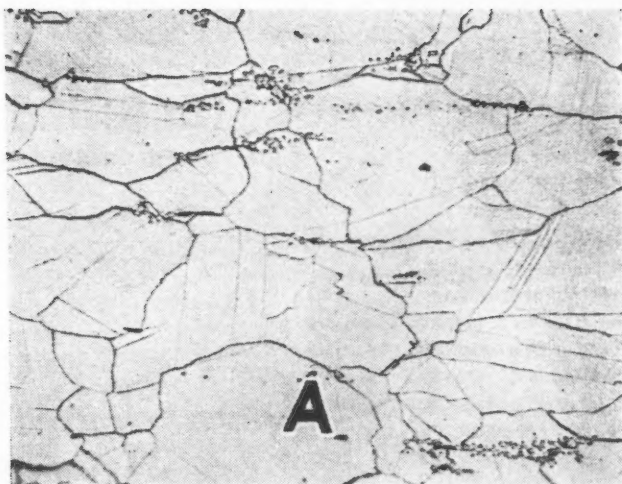
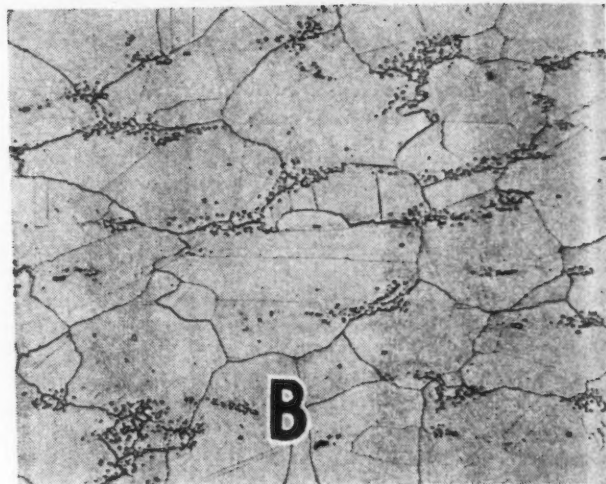


FIG. 2 — Typical microstructures of bucket wheel material.  
(A) Timken alloy rim section; hot forged at 2050°F, hot-cold forged at 1200°-1350°F, annealed 1200°F for 4 hr. Etch; glyceresia — 100X



(B) Center section of a Timken alloy wheel. Thermal treatment same as above. Etch; glyceresia — 100X

ings. Alloys may be added to cast buckets which will give higher properties than have been obtained in a wrought material. These castings are made by the lost wax method<sup>2</sup> similar to that used in producing dental plate for false teeth. The bucket produced is within a few thousandths of proper dimensions and can be used in the wheel assembly by merely grinding off the sprue, locating tabs, and band edges. All

<sup>2</sup> See "Precision Casting of Turbosupercharger Buckets," A. W. Merrick, THE IRON AGE, Feb. 10, 1944.

buckets are X rayed for internal flaws before assembly. The use of the precision casting saves substantial forging and machining labor.

In using the forged bucket, 75 pct of the material is lost in machining operations, while the cast bucket is used essentially as-cast. Although the cast bucket is more highly alloyed than was the forging, the material utilization largely offsets the increased use of alloy. At the same time the cast bucket has greater service life under the operating conditions of the turbosupercharger.

The buckets are now welded to the wheels with modified KA<sub>2</sub>SMo (Type 316) weld deposit. Fig. 3

shows a typical joint produced in this manner. This process results in a stronger joint than the dovetailed assembly previously used and also allows better heat conduction from the buckets. In some designs the wheel is flash welded to the shaft. This change results in a considerable reduction in stress previously encountered around the three bolt holes and pilot of the bolted assembly. Bucket materials used over the past 25 yr, together with their chemical analyses, are shown in the lower sections of table I. Fig. 4 portrays graphically the improvement in bucket materials over the past 25 yr. It will be noted, fig. 4, chart D, that Vitallium<sup>2</sup>, which is now in general use, has approximately seven times the life before failure of 17W when stressed at 10,000 psi at 1500°F; for 1000-hr life the stress on Vitallium may be nearly 50 pct higher than 17W.

The first nozzlebox was made of deep drawing steel, acetylene welded and calorized. The next nozzlebox was made of deep drawing steel, copper brazed and nickel plated. Since the gas is passing through this box at 1600°F, or higher, while the outside may be exposed to below zero temperature, the need for a more corrosion and oxidation resisting material was indicated. In 1933 a nickel-chrome-molybdenum austenitic steel was put into use. This could be welded and had substantially greater life under operating conditions. Experimental work proved that a modification of the composition reducing the molybdenum resulted in improved ductility and impact after exposure to operating temperatures. In 1942 the diaphragm which had previously been fabricated of the same material was made of 25 Cr-20 Ni material

TABLE I

Composition of Materials Used for Supercharger Wheels and Buckets from 1918 to 1945

Supercharger Wheels

	C	Cr	Ni	W	Mo	V	Si	Cb	N <sub>2</sub>	Fe
SAE 2335..... 1918-1925	0.35	Nil	3.0	Nil	Nil	Nil	0.35	Nil	Nil	Bal.
SAE 6150..... 1925-1930	0.50	1.0	Nil	Nil	Nil	0.20	0.35	Nil	Nil	Bal.
Silchrome No. 1..... 1930-1937	0.45	8.5	Nil	Nil	Nil	Nil	3.00	Nil	Nil	Bal.
17W..... 1937-1943	0.50	12.0	19.0	2.25	1.0	Nil	0.60	Nil	Nil	Bal.
Gamma Cb..... 1941	0.40	15.0	25.0	Nil	4.0	Nil	1.00	2.00	Nil	Bal.
Timken alloy..... 1941-1945	0.12	16.0	25.0	Nil	6.0	Nil	0.60	Nil	0.15	Bal.

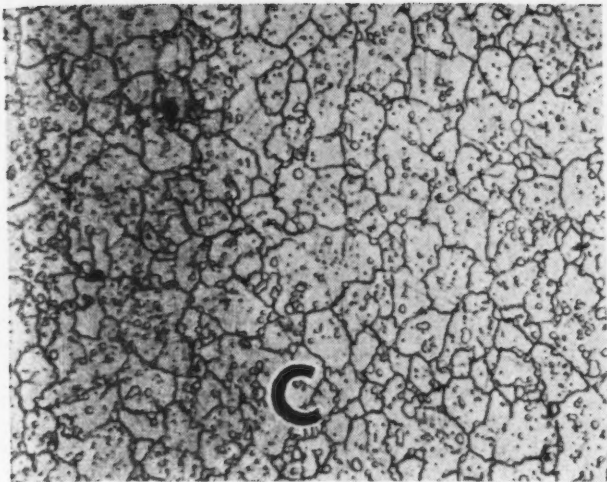
Buckets

	TC	Cr	Ni	W	Mo	V	Si	Cb	N <sub>2</sub>	Fe	Co
SAE 6140..... 1917-1922	0.50	1.0	Nil	Nil	Nil	0.2	0.3	Nil	Nil	Bal.	Nil
Silchrome No. 1..... 1922-1928	0.45	8.5	Nil	Nil	Nil	Nil	3.0	Nil	Nil	Bal.	Nil
K&E-965..... 1928-1933	0.38	13.0	13.0	3.0	Nil	Nil	1.4	Nil	Nil	Bal.	Nil
17W..... 1933-1942	0.50	12.0	19.0	2.25	1.0	Nil	0.6	Nil	Nil	Bal.	Nil
Vitallium..... 1942-1945	0.20	30.0	Nil	Nil	5.5	Nil	0.6	Nil	Nil	1.0	Bal.

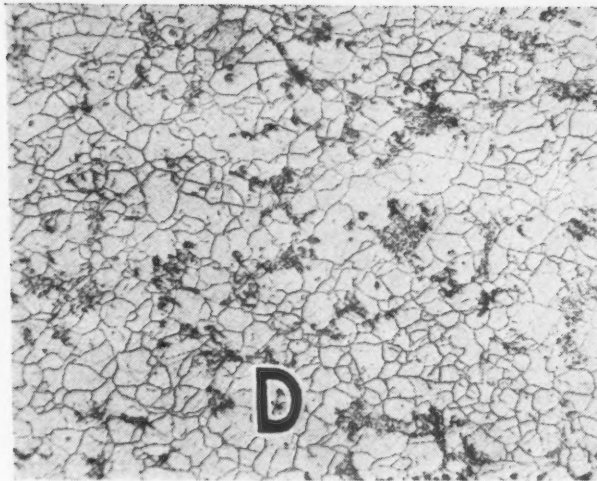
TABLE II

Nozzlebox, Cooling Cap and Diaphragm Part Materials (Approximate Chemical Composition)

	TC	Ni	Cr	Mo	Si	Cb	Ti	P	S
Deep drawing steel.....	0.15	Nil	Nil	Nil	0.3	.....	.....	0.03	0.03
KA <sub>2</sub> SMo (Modified).....	0.08 max	13.0	18.0	2.25	0.7	.....	.....	0.03	0.03
25-20 diaphragm.....	0.18 max	18.0	24.0	Nil	1.5	.....	.....	0.03	0.03
Cooling cap 18-8-Ti.....	0.06	10.5	18.0	Nil	0.7	.....	0.62	0.03	0.03
Cooling cap 18-8-Cb.....	0.07 max	10.5	18.0	Nil	0.7	0.70	.....	0.03	0.03



(C) Rim section of 17W alloy bucket wheel; hot forged at 2100°F, hot-cold forged at 1200°-1350°F, annealed 1200°F for 4 hr. Etch; 10 pct Nital — 500X



(D) Rim section of Gamma Cb wheel; thermal treatment same as for 17W alloy above. Etch; 10 pct oxalic acid electrolytic — 100X

(see fig. 5). This diaphragm was centrifugally cast to size. It was possible through the use of this casting to get a more rigid diaphragm and eliminate some machining and welding operations. The operational performance of the cast diaphragm is substantially superior to the welded diaphragm and the substitution of the cast diaphragm for the fabricated one involves large savings in strategic alloys.

The cooling cap has been recently made of 18-8 stabilized with titanium or columbium. The approximate chemical compositions used for nozzlebox, cooling cap and diaphragm parts are shown in table II.

Compressor casings were first made experimentally from a solution-treated and aged aluminum-copper alloy. Trouble was experienced in distortion and to overcome this difficulty an aluminum-silicon-magnesium alloy, aged but not solution treated, was tried. This proved to be satisfactory on test, but considerable difficulty was encountered in machining the relatively soft alloy.

The next change was to our present aluminum-copper-silicon-magnesium alloy, aged but not solution treated. This not only overcame machining and distortion troubles, but had other advantages, such as better high temperature properties and good castability, which led to its retention as a standard. When the casings were first made they were the largest permanent mold castings that had been made up to that time.

Although our present material appears to be satisfactory, a casing of lower weight, lower cost, or both, would be welcome, and to this end tests are going forward on cast magnesium casings and fabricated steel casings.

The requisites of a good supercharger impeller are: (1) Light weight; (2) high bursting speed; (3) low stretch at tip speed in excess of 2000 ft per sec; (4) high endurance limit; (5) ability to transmit and redistribute local stresses; (6) satisfactory machinability; (7) satisfactory ductility for forming blades; (8) high stress rupture strength at operating temperatures; (9) relative freedom from stress corrosion, and (10) good forgeability.

Alloy 25-ST has been used since 1927 for impellers for both geared and turbine-driven superchargers.

The service life of this material has been quite satisfactory.

War demands for high altitudes have resulted in the testing of many other materials. Some of these materials have been found superior to 25-S in specific

TABLE III

Comparative Characteristics of Light Metal Alloys Used for Supercharger Casings, Diffusers and Impellers

*Physical Characteristics*

	25-ST	14-ST	X-76	Dowmetal J-1
1. Weight .....		same	same	34 pct lighter
2. Bursting speed .....		slightly higher	slightly higher	13 pct higher
3. Stretch .....		much less	much less	same
4. Endurance limit .....		same	same	30 pct lower
5. Mechanical Properties				
Tensile, psi .....	52-60,000	62-74,000	71-78,000	43-48,000
Yield, psi .....	30-40,000	54-64,000	66-72,000	32-37,000
Elongation, pct .....	7-18	1-14	2-15	3.5-12
6. Blade formability .....	good	poorer	poorer	poor
7. Stress rupture				
Stress for rupture, psi, at 300°F—				
10 hr. ....	36,800		44,500	20,000
100 hr. ....	29,400		32,700	15,000
1000 hr. ....	21,500		24,000	10,500
Stress for rupture, psi, at 400°F—				
10 hr. ....	21,000	32,500	21,000	5,000
100 hr. ....	15,100	24,400	13,900	
1000 hr. ....	10,900	13,400	9,200 approx.	
8. Stress corrosion .....	good	fair	poorer	poorer
9. Forgeability .....	good	fair	poorer	poorer

*Chemical Composition*

Alloy	25-ST	14-ST	X-76	255	Dowmetal J-1
Cu .....	3.9-5.0	3.9-5.0	0.5-2.0	1.0-1.5	0.15 min.
Mn .....	0.4-1.2	0.4-1.2	0.4-0.8		
Si .....	0.5-1.2	0.5-1.2		4.5-5.5	Balance
Mg .....		0.2-0.75	1.4-3.0	0.4-0.6	0.4-1.5
Zn .....			5.0-8.0	Balance	5.8-7.2
Al .....	Balance	Balance	Balance		

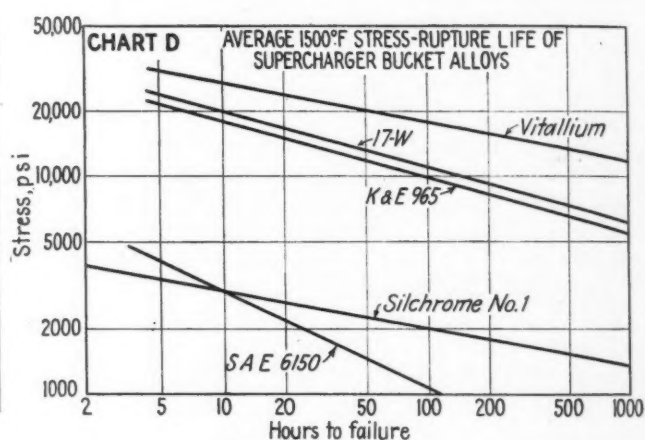
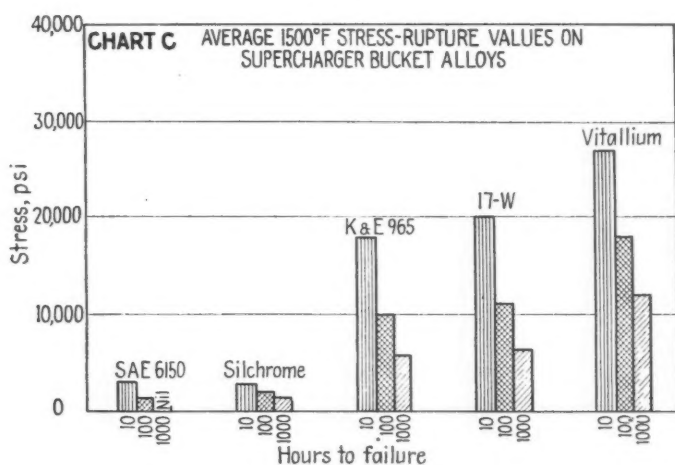
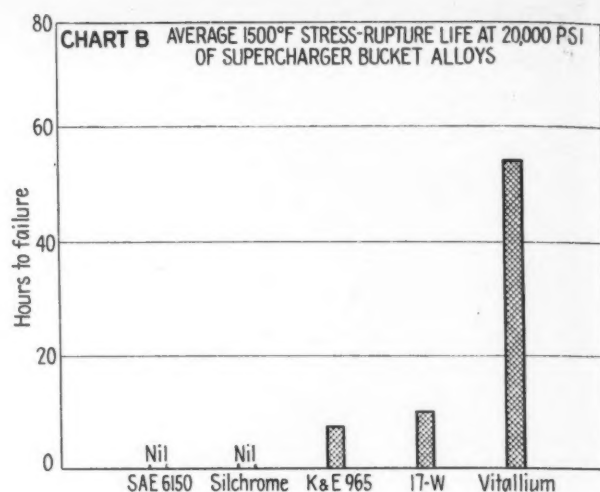
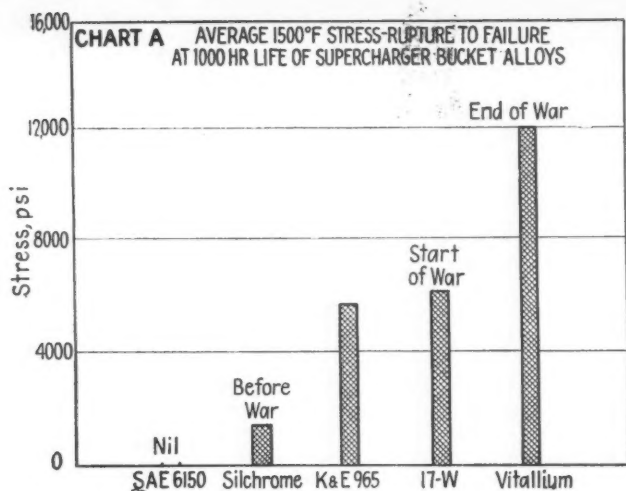


FIG. 4 — Graph D (lower right) indicates rupture strength of various bucket materials used to date. Chart A (top left) shows the strength for 1000-hr life of materials used for buckets at 1500°F. Chart B gives the time to failure of bucket materials stressed at 20,000 psi at 1500°F, while graph C illustrates 10, 100 and 1000-hr life on bucket alloys.

FIG. 3 — Microstructure of juncture of Vitallium bucket and KA<sub>2</sub>SMo weld, strain relieved at 1100°F. Etch; 10 pct oxalic acid electrolytic — 100X

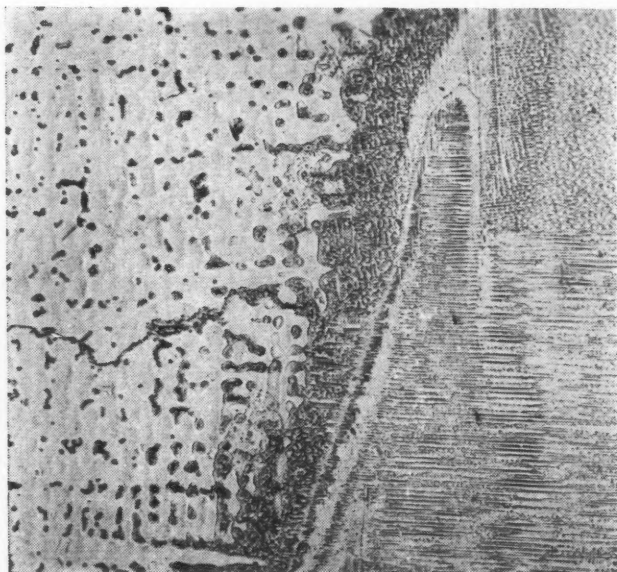
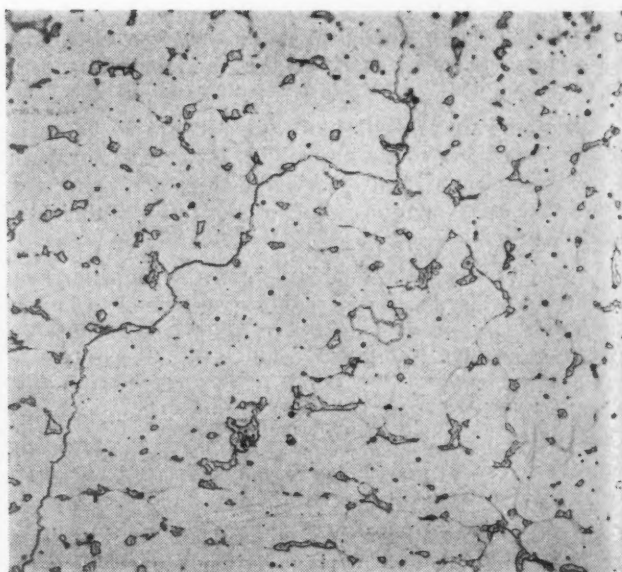


FIG. 5 — Cast diaphragm of 25 Cr-20 Ni material; annealed 2050°F. Etch; 10 pct oxalic acid — 100X.



characteristics, but the bursting speeds have in most cases been much more erratic. This is probably due in large degree to inability to redistribute local stresses due to low elongation, especially across the grain of the material. Two typical materials are 14-ST and X-76, which possess the highly sought characteristic of low stretch at high speeds, and for this reason the former may be used in certain new impellers.

Magnesium hot pressed alloys, J-1 and O-1, are the only materials that have thus far shown consistently higher bursting speeds, but they have fallen short of 25-S in some of the other requisites. The comparative characteristics and chemical composition of these alloys are given in table III. From these illustrations it is apparent that we have not yet found any one ma-

terial which is superior to 25-S in all necessary requirements.

Some of these data are based on so few tests that results should not be considered conclusive, and further tests of impellers made under improved conditions may change the order of merit. Tests are being conducted to find improved materials for supercharger wheels, buckets, nozzlebox, impeller and casings to allow longer life, and higher speeds and temperatures. It is also hoped that alloys with satisfactory properties which contain less strategic materials will be found.

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*In the second part of this article, to be published next week, the development of material for use in aircraft gas turbines (jet and prop-jet engines) is discussed.*

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## Welded Truss Stresses Tested with Strain Gages

THE Austin Co., which 6 months ago adopted a new design for welded trusses of standard 50, 60, 70 and 80-ft lengths in which H-sections with their webs in a vertical plane are used throughout without gusset plates, has just completed a series of tests in which strain gages were used, revealing in detail how the stresses flow through truss joints of this type.

Representing what may be the first such application of this equipment, a total of 144 strain gages were used in the tests which were conducted on a pair of 80-ft standard trusses, shown in the accompanying illustration. SR-4 strain gages were attached to the joints at both ends of the first diagonal and at certain other important points, and placed on the same locations on both trusses to provide a check. The strain gages,<sup>1</sup> made by the Baldwin Locomotive Works, make it possible to measure instantly the average strain in a 1/2-in. length to one-millionth of an inch.

Test loads were applied by placing 60-ft lengths of structural steel on the trusses in a manner which concentrated the full load on purlins located directly above the vertical truss members. Strain measurements were recorded by three automatic switching units and three SR-4 strain recorders made by the Foxboro Co. and rented from Baldwin Southwark. Each pair of instruments, including a switching unit plus a recorder, made an automatic written record

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<sup>1</sup> Principle and operation of these strain gages is explained in "Electric Strain Gages Aid Machine Design," THE IRON AGE, Apr. 11, 1946, p. 50

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of the strains at 48 gage points, so that 144 individual strain readings could be recorded in about 2 min.

The first test was made under a load somewhat over the design load, after which the entire load was removed. In the second test the following day, the trusses were loaded to a total of 254,000 lb, which was the equivalent of dead load represented by a cement tile roof deck plus twice the live load figured at 35 lb per sq ft. The maximum deflection with this peak load in place was about 2 in.

After the peak load had been reduced to 196,000 lb, this load was left on the trusses for 3 days over a weekend and the test was then completed. After removal of the total live load, both trusses showed a maximum residual deflection of 1/16 in. While the strain readings are still being analyzed for guidance in the design of trusses of this type, J. K. Gannett, Austin Co. vice-president and director of engineering and research, stated that the results confirm the soundness of present design methods. All of the readings taken during the tests indicated that satisfactory truss action was taking place throughout both trusses at all times, he said.

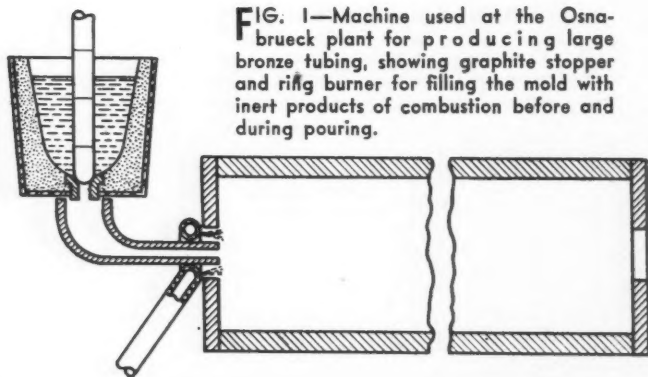


# Centrifugal Casting In Germany

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**A report on the status of centrifugal casting practice in Germany immediately after V-E day is presented herewith. This article is condensed from a report prepared by James T. MacKenzie, chief metallurgist, American Cast Iron Pipe Co., Birmingham, for the U. S. Technical Field Information Agency, USFET. The report is based on personal observations of Dr. MacKenzie.**

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**FIG. 1**—Machine used at the Osnabrueck plant for producing large bronze tubing, showing graphite stopper and riffling burner for filling the mold with inert products of combustion before and during pouring.

**T**HIS investigation was made to determine whether the Germans had made any significant developments in the centrifugal casting of metals which might be useful or suggestive of improvement in the widespread application of this method of casting in the United States and the United Kingdom.

The investigation included the following plants: (1) Kupfer & Drahtwerk at Osnabrueck, casting a variety of nonferrous metals and alloys; (2) Bochumer Verein at Bochum, casting steel gun barrels in sand lined molds; (3) Hochfrequenz Tiegelstahl, A. G. at Bochum, casting aircraft engine cylinder liners, bi-metallic tubing, and other hollow cylindrical bodies in induction furnace steel; (4) Schalker Verein, Div. of Vereinigte Stahlwerk at Gelsenkirchen, large makers of cast iron pipe in metal molds; (5) F. Krupp at Essen, discontinued centrifugal casting at Essen early in the war; (6) Annener Gusstahlwerk of Ruhrstahl, A. G. at Annen (near Bochum) casting steel tubing, mostly high chromium, in sand lined metal molds, electric furnace steel. Aircraft engine cylinder liners in refractory coated metal molds—induction furnace steel. Ball races and brake drums cast vertically in cement-sand molds of induction furnace steel; (7) Alfred Teves, Maschinen u. Armaturen Fabrik at Frankfurt a.M., casting automobile engine cylinder liners of gray cast iron in metal molds of cupola iron; (8) Buderusche Eisenwerke at Wetzlar, casting gun barrels vertically in metal molds of electric furnace steel. Also a plant for the manufacture of cast iron pipe in metal molds, and (9) Halberger Huette at Saarbruecken, manufacturing cast iron pipe in sand molds of cupola iron and direct metal treated and kept hot in a mixer.

While the above plants only represent some 60 or 70 pct of the plants making centrifugal castings, conversation with the Germans and with other investigators leads one to believe that they represent all the types of casting in use in Germany, Austria and Czechoslovakia. For example, we are reliably informed that Krupp's plant at Blankenberg for cylinder liners is the same as

*Copies of the complete report, "Centrifugal Casting of Metals in Germany," may be purchased in either microfilm or photostat form, from the Office of Technical Services, Dept. of Commerce, Washington.*

Teves and that the Skoda plant for vertically casting gun barrels at Pilsen is exactly the same as that in use at Buderus in Wetzlar. Also the plant at Roechling-Buderus at Wetzlar uses the same method as Bochum Verein. It is believed that for all practical purposes the investigation should be considered as complete coverage of the field.

Centrifugal casting of metals was developed in Germany to a degree comparable with that in the United States and rather beyond that in Great Britain. The largest tonnage item, that of cast iron pipe, was without significant developments, the methods and machines being those in common use for sometime before the war. In fact, one of the largest and newest plants, that of Buderus at Wetzlar, was shut down early in the war as sufficient production was available from other plants.

The manufacturer of automotive cylinder liners and barrels was on about the same plane of technical development as in the United States and Great Britain. The use of the thin silica sand lining as developed by Poltzguter was new to us and may turn out to be an important contribution. For cast iron liners, the machines and methods are the same as developed by Hurst in

England, but for steel liners the machines are nearly the same as the newest machines in the United States, i.e., those at Ford Motor Co. and at the American Cast Iron Pipe Co., the chief advantages of which are the simple cylindrical shape of the mold, which eases the thermal stresses, and the removal of the mold from the machine after each cast which gives better control over the mold temperatures and allows better dressing.

The casting of steel gun barrels was highly developed and the use of the thin sand mold, clean silica sand (about 30 to 70 mesh) spun in the mold just before casting, may be a real advance in casting heavy tubing. The molds used were of chrome steel, only 1 to 1½ in. thick, and ran in water. The method of placing this lining is to put the necessary amount of sand in a trough the same length as the mold. This is mounted on a car and the sand is put in place by dumping the trough after the mold has reached full speed. For gun barrels the optimum thickness was given us as 5 mm (approx 0.2 in.) and they stated if the sand was too thin, e.g., 3 mm (0.18 in.), the casting would crack longitudinally, whereas if it were too thick, e.g., 7 mm (0.28 in.), it had a tendency to wash and swells were experienced. There is some penetration of the sand by the molten steel but this does not seem to result in a lifting of the sand and the sand comes off very readily in the heat treatment that follows.

The vertical method in use at Buderus and Skoda does not seem to be as good as the horizontal method at Bochum and Roechling-Buderus, nor as good as the horizontal method in the United States. A weighed amount of steel is poured into a heavy cast iron mold spinning at about 200 rpm, care being taken that the stream does not strike the mold wall. When all metal is in the speed is increased to 1400 rpm for the 88 mm (3.46 in.) and up to 2000 for the 60 mm (2.36 in.) barrels. As a matter of fact the vertical method of spinning gives really an ingot with the piping and segregation accentuated and highly localized so that on boring the barrel only good steel is left. The paraboloidal cavity in the 88 mm gun only extends some 3 or 4 ft down from the top as cast and a foot or so of this was removed in machining. Physical properties of the barrel, however, as reported to us, were as good as the horizontally cast. Our impression is that the breech of the long guns is not cast so thick as the U. S. guns and they told us the practice was to shrink another tube on these guns.

The thin sand lined mold was also used very successfully for the horizontal spinning of high chrome steel tubing. This operation utilized a water cooled metal mold with the thin sand lining using a thickness of sand of only 2 mm (0.079 in.) and the surface looked very good indeed. However, the high chrome steel tubing wall thickness was very much less than that of the gun barrel. This steel would be difficult to oxidize in heat treatment if it penetrated the sand like the carbon steel but it did not seem to do so. These tubes are cast up to 500 mm (approx 19.7 in.) in 3½ meter (10.6 ft) lengths, wall thickness of 1 to 2 in.

Vertical spinning in cement sand molds or oil sand cores is apparently on a par with similar production in the United States. The general method is to pour while the mold is stationary and then spin at about 300 rpm. The principles of directional solidification are carefully observed. Beautiful ball races, brake drums and gear blanks were being produced by this method in both steel and bronze.

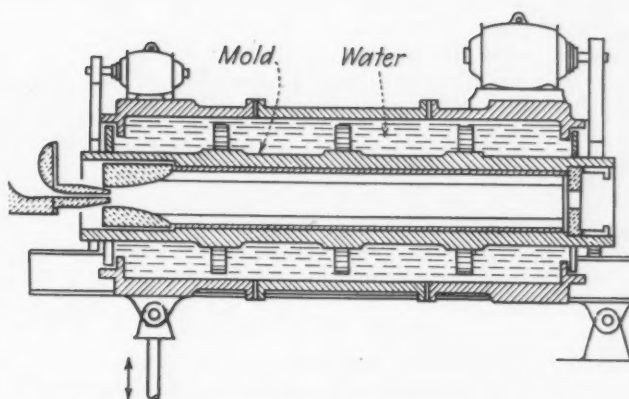


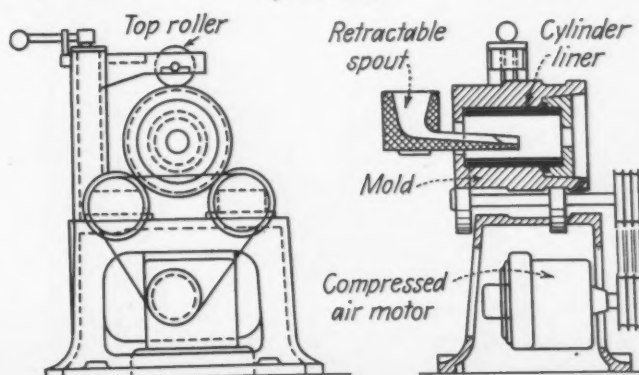
FIG. 2—The casting machine for steel tubing at the Annen plant of Ruhrstahl. The same layout was used for gun barrels at Bochumer Verein and several other plants.

Casting of brass and bronze is done in quite large sizes. Tubes up to 2½ meters (8 ft) diam are spun up to 3 or 4 (9.8 or 13.1 ft) meters in length, and tubing of 1 meter OD is made up to 12 meters' length (40 ft), the limiting factor in length and/or thickness being the capacity of the furnace, which was 22 tons. One feature of considerable interest was the use of a thin copper sheet as a lining for the cast iron mold. This is cut exactly to size and slipped into the mold just before casting. They also fill the mold with burnt coke oven gas before pouring and keep the gas on until the bronze is set. This was said to eliminate pin-holes and to add greatly to the life of the mold. They also appear to be using very high speeds on their nonferrous work.

At the Frankfurt plant it was reported that for facing, about an ounce of graphite powder was thrown in the mold just before casting. A suction system collects the graphite after the extraction of the casting, cleans it of iron by a magnet and returns it for reuse. The plant superintendent reported that the graphite worked better after reuse than when it was new. This plant cast gray iron automotive cylinder liners and asserted that no heat treatment was necessary as no chill was experienced.

Sketches accompanying this article illustrate several interesting phases of German casting equipment. Fig. 1 shows the pouring device used with the Osnabrueck machine for casting large bronze tubing. This device consists of a small ladle with a bottom orifice and a graphite stopper, the latter being used to hold the metal until the ladle is full. The size of the orifice va-

FIG. 3—The casting machine used at Annen and Bochum for cylinder liners.



ries with the metal weight. The ring burner at the head of the machine is used to fill the mold with inert combustion products before and during pouring.

Fig. 2 is the machine used to cast steel tubing at Ruhrstahl and gun barrels at Bochumer Verein and other plants. It is a very heavy machine with three sets of four rollers. The flask is direct driven through a train of gears by a motor in the side of the machine and runs totally immersed in water. Ends are sealed by flat rubber gaskets. This machine tilts to an angle of 12 to 15° during casting and stripping.

A battery of six machines of the type shown in fig. 3 were used at Bochum for casting motor cylinder liners. This is a simple three-roller type driven by air motors, in which the cylindrical flask lifts out, as in the Ford and Acipco units in this country. This type machine was also used at the Annen plant of Ruhrstahl for steel liners for automotive engines. Fig. 4 shows the arrangement used at the Annen plant for casting the steel liners in the machine illustrated in fig. 3.

The pouring device used at Buderusche Eisenwerke in producing steel gun barrels is shown in fig. 5. This is quite like an ordinary foundry pouring basin with a slag dam. The orifice is carefully centered by a rig similar to a wall crane and the base must be truly vertical so the falling metal hits the bottom plate and not the mold wall. The orifice is 18 to 20 mm in diam and 200 mm long. The same size orifice is used for all casting produced in this machine.

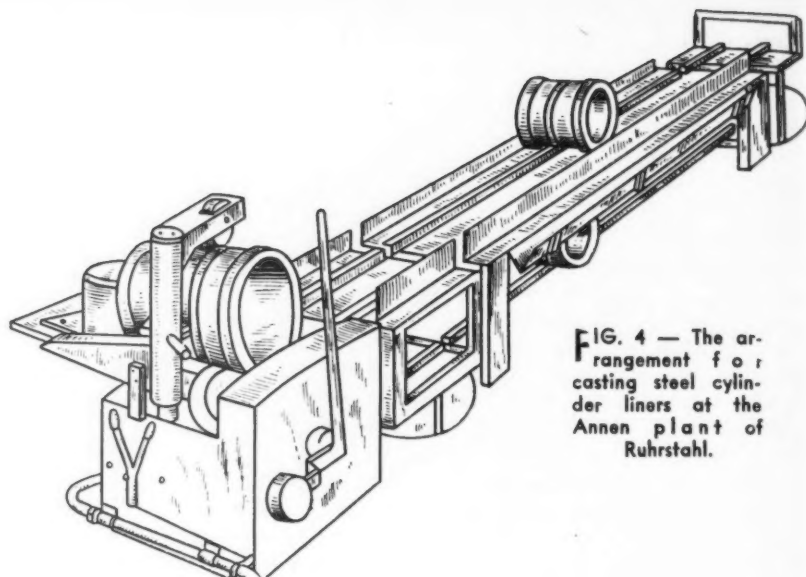


FIG. 4 — The arrangement for casting steel cylinder liners at the Annen plant of Ruhrstahl.

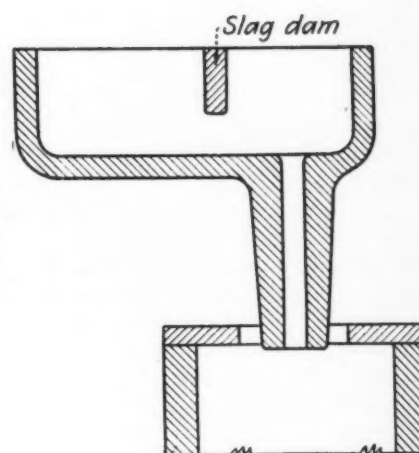
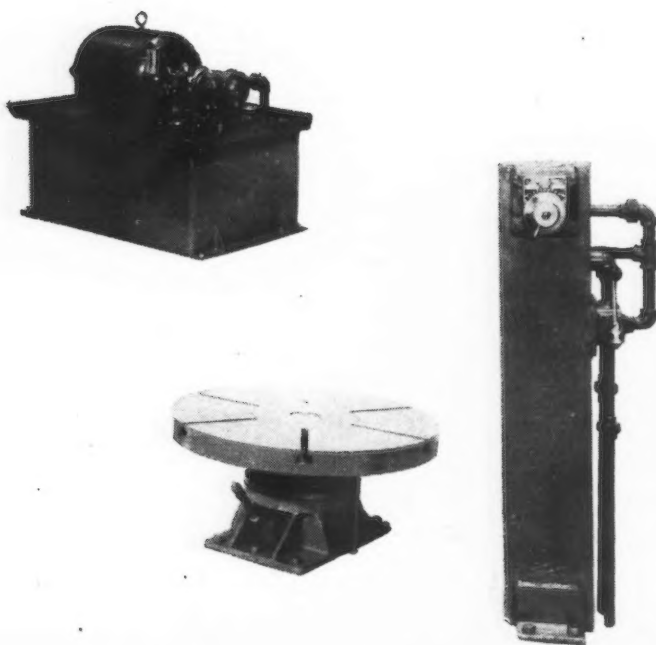


FIG. 5—The pouring trough for pouring vertically spun gun barrels, used at the Wetzlar plant of Buderusche Eisenwerke.

## Hydraulically Operated Centrifugal Casting Machine



A CENTRIFUGAL casting machine controlled and operated entirely by hydraulic power has been developed by Herman Pneumatic Machine Co., Pittsburgh. This machine is shown in the accompanying illustration. The hydraulic feature is said to provide smooth stepless variance of table rotative speeds throughout the entire operating range. Speed may be varied, while the unit is operating, by movement of a control lever on the operating pulpit. The hydraulic power unit is installed separate from the machine to minimize operating hazards. The power unit may be placed at any desired location relative to the casting machine and more than one casting machine may be operated from one power unit.

One operating valve is employed to start, brake, stop or reverse the machine. The reversing feature is said to provide practically instantaneous stopping of the rotating table if necessary. Moving parts of the casting machine and practically all parts of the power unit are immersed in oil, eliminating lubrication. Remote installation of the power unit with respect to the casting machine is expected to increase the operating life of the unit.

# Production Control For Small Plants

ONE of the problems facing smaller plants<sup>1</sup> in their efforts to establish efficient production control methods is the development of a procedure which is simple and inexpensive, yet effective. A combined operation, route and production report card has been developed to meet this problem and is giving very favorable results in several small plants on the West Coast. The control system described graphically in the accompanying illustrations, has been installed in such plants as a sheet metal shop, a processing plant, a general fabrication and machine shop and in plants in the food field.

Preliminary arrangements necessary prior to the installation of this system are quite simple. The plant must be divided into departmental units or material stops, called operational areas. These operational areas

<sup>1</sup> An effective production control system applicable to larger plants was described in the article "Putting Production Control to Work," THE IRON AGE, May 16, 1946, p. 40.

should be stops where different operations are performed, such as stamping, welding, finishing, etc. Each operational area should have a simple production control board which is divided into three sections so that control can be maintained on (1) orders to be worked, (2) orders completed and (3) orders out-going. An understanding of the use of these boards can be obtained in the accompanying outline of the flow of the route card through the shop.

Simple changes in the card headings can be made to suit specific shop and management conditions. The

**An inexpensive yet effective production control method being successfully used by several West Coast plants is described in this article. This control method, developed primarily for smaller plants, is built around a combined operation, route and production report card.**

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Consultant,  
Trumpis-Collar & Associates,  
Los Angeles

route card, fig. 1, contains all items necessary for operational analysis. This card, 8½ x 11 in., is of light weight cardboard and is perforated at the dotted line in order that it can be divided into two parts. For the purposes of description, the original copy of the route card is called the No. 1 card, and is divided into an A section (the left side) and a B section (right side). Thus, 1A represents the left side of the original card. The duplicate card is called the No. 2 card and is similarly divided into 2A and 2B, indicating the left and right sides respectively. With the system in complete operation, the card provides the necessary data concerning scheduling, routing, instruction and production control.

(CONTINUED ON NEXT PAGE)

PART NAME				QUANTITY	PART NUMBER		QUANTITY	OVERSTOCK		SPARES		
DELIVER TO				TYPE	MODEL	SHIP SERIAL	OVERSTOCK	SPARES	MODEL	SHIP SERIAL	CHG. TO CLASS ORDER	
MATERIAL				UNIT SIZE	DESCRIPTION AND SPECIFICATION	RELEASE CODE	DATE WRITTEN	MATERIAL	UNIT SIZE	DESCRIPTION AND SPECIFICATION	RELEASE CODE	
OPER. STD. NO.				DEPT.	OPER. AREA	OPERATION	DESCRIPTION	TOOL, JIGS AND FIXTURES	CO. INSP.	GOVT. INSP.	QTY. OPER. REQ.	
NEXT ASSY.				QTY. ASSY.	PARTIAL DELIVERY REC.		RECD. IN STOCK BY		REMARKS		PARTIAL DELIVERY REC.	
DATE				DIV.	QTY.	QTY.		DATE		DATE		DIV.
DATE				DIV.	QTY.	QTY.		DATE		DATE		DIV.
SHOP ORDER BENCH COPY												
SHOP ORDER BENCH COPY												

FIG. 1—The route card, heart of the control system, is shown here. Two copies of this card are used with each work order—the original or No. 1 card, and the duplicate or No. 2 card. The section of each card to the left of the perforation is the A section; to the right is the B section. Thus, the left side of the original copy is referred to in the accompanying diagrams as "1A".

Handling of the production control cards during the processing of a typical item is illustrated in these sketches. The No. 1 card is the original; No. 2 card is the duplicate copy.

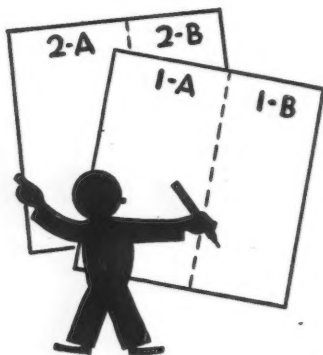
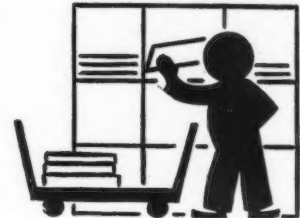


**1** Material is brought to departmental incoming area.



**2** Material and route cards are checked for proper routing.

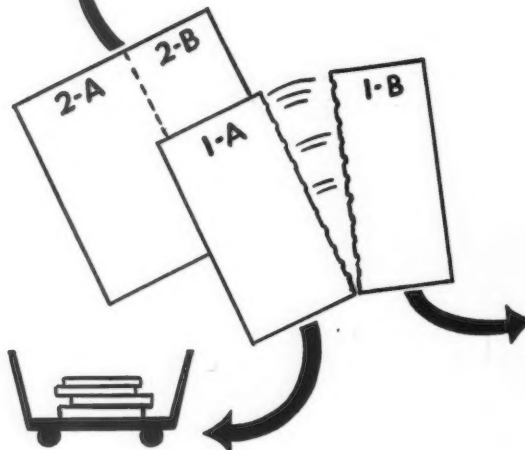
**3** Material is moved to the temporary storage section of the operational area.



**4** Utility man notes the temporary storage location on 1B and 2B sections of route card.



**5** Utility man delivers second copy of the route card to the production control booth.



**6** 1B is separated from 1A and deposited in "Orders to be Worked" section of the production control board (shown in fig. 13).

**7** 1A remains with the material.



**8** Worker obtains 1B from the production control board and matches it to the job.

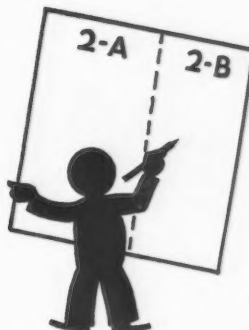


*and*

**9** Upon completion of the job, the worker enters date and number of pieces completed on 1B and returns card to "Orders Completed" section of the production control board.

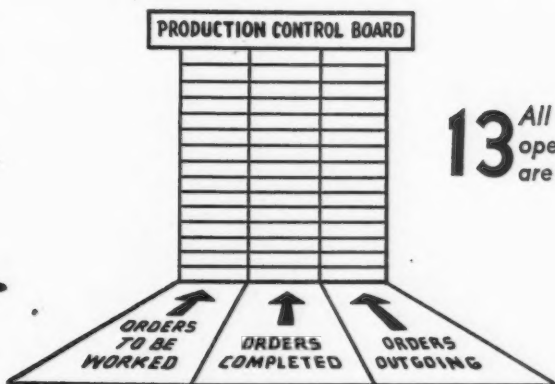


**10** Production control clerk collects production information from 1B and stamps card. If material requires another operation in same work area, 1B is returned to "Orders to be Worked" section of control board. If material is to be moved to another work area, 1B is returned to the "Orders Outgoing" section of the Board.



**11** Production control clerk enters production figures on second copy of route card.

**12** Upon completion of work within work area, utility man obtains 1B from "Outgoing" section of production control board, and matches it to parts. He then collects second copy from production control booth and moves all to new job area.



**13** All steps are repeated within each operational area until the parts are all fabricated.

**14** Production control clerk forwards accumulated figures to the performance report in group. Weekly reports and timekeeping reports are combined to form the performance report.



# Temperature Measurement of

*In Great Britain, as well as in this country, the subject of temperature measurement of liquid steel is of vital importance to the steelmaking industry. The author reviews the progress of liquid steel pyrometry in Britain and describes in detail the latest type of immersion thermocouple equipment.*

LEFT

FIG. 1—Typical light thermocouple arm with no external insulation.

o o o

LOWER RIGHT

FIG. 2—Typical thermocouple arm in use in conjunction with a recorder.

The installation should preferably be of a type which does not impede furnace operations. It should be robust enough to stand up to steel plant conditions and give reliable and consistent service. Its use by one unskilled operative is a distinct advantage and to this end human error must be reduced to a minimum. For industrial use its initial cost and subsequent maintenance should be of a small order. Contamination and embrittlement of the rare metal couple wires at temperatures of 1450° to 1650°C (2642° to 3002°F) was also a problem to be considered.

These conditions are very severe for scientific equipment but all have been overcome by the cooperative work of the investigators engaged on this problem. The latest installation in use entirely fulfills all the

METHODS of measuring liquid steel temperatures in the furnace bath or ladle have received much attention by metallurgists and steel makers during the past 10 yr or so.<sup>1-6</sup> In Britain a number of miscellaneous methods for determination of temperature have been considered,<sup>1</sup> and of these possible methods, the thermocouple method was considered to be most promising. The use of photoelectric cells has also been developed to some degree and this work still continues. However, the "quick immersion" thermocouple has been generally adopted for practical use in steel plants. This thermocouple is a platinum-platinum-rhodium unit, lightly sheathed in silica, capable of being plunged into liquid steel with a slag cover. It must give an accurate reading of temperature and be withdrawn intact. This has been achieved with such success that the method is used with confidence as a further control in the steelmaking process.

The ideal installation was a permanent or semi-permanent type of couple combined with a visual and automatic record of the temperature under steel plant conditions. The instrument should have an accuracy of  $\pm 5^{\circ}\text{C}$  ( $9^{\circ}\text{F}$ ). The slag cover tends to destroy or contaminate any equipment in contact with it and the slag itself is at a higher temperature than the metal.



# Liquid Steel ♦ ♦ ♦

By D. MANTERFIELD

*Steel, Peech & Tozer,  
Sheffield, England*

conditions laid down above. Some variations in design and alternative methods of measurement have been in use for some years on many steel plants.

As a matter of interest it is proposed to briefly trace the development of this equipment to its present stage giving indications of the methods used to overcome the various difficulties.

## Thermocouple Arms

In principle, the thermocouple arm consisted of a steel tube with a right angle bend through which the thermocouple wires pass to the hot junction end. These are internally insulated by fireclay insulators or braided glass sleeving. At the cool end a reserve of wire is accommodated to renew the hot junction when necessary. The hot junction end is usually insulated to within an inch or so of the end by twin-bore silica or fireclay insulators and this is protected from the slag, steel and fume by a thin-walled silica sheath. From the cool end, compensating leads proceed to the indicator or recorder. The silica sheath is renewed after each immersion and a new hot junction is made after about 15 immersions.

For high-frequency furnaces and small ladles, a small light thermocouple arm with no external insulation is used. Fig. 1 shows a typical instrument and fig. 2 illustrates one in use in conjunction with a recorder. The smaller arc furnaces are served by a larger instrument of similar design. In this case, however, it is necessary to protect the end of the arm from slag, for which purpose a graphite sleeve about 1½ in. diam is usually used to protect the last 6 in. or so of the arm.

A still larger, but similar type, is used for the

smaller openhearth and some electric furnaces. The last 6 ft or so are externally insulated by a layer of suitable refractory cement and an end block of graphite is again used. Fig. 3 shows such an instrument in use with a large dial indicator.

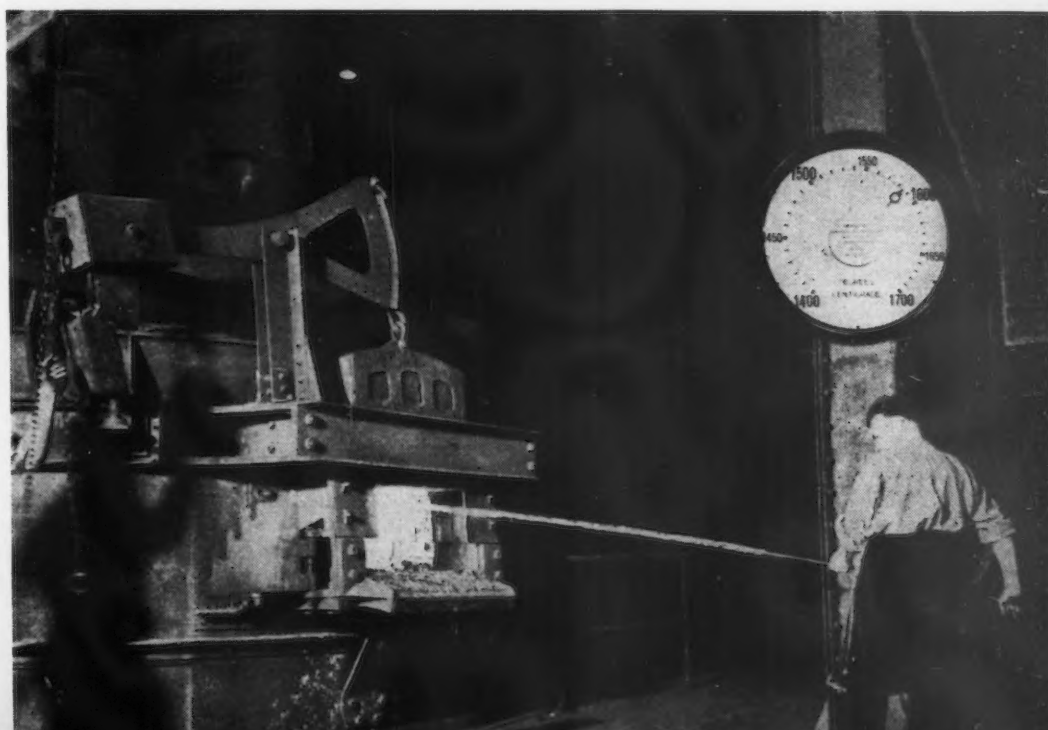
The preceding types of instrument are all hand manipulated, but for larger openhearth furnaces a trolley instrument has been devised which has a longer and heavier arm with a vertical member at the hot junction end. The main arm is protected for half its length at the hot end by diatomite sleeves. The vertical member was until recently protected by the usual graphite sleeves but these have now been to some extent replaced by mild steel cylinders. This is somewhat revolutionary but has been highly successful and will be discussed in more detail later.

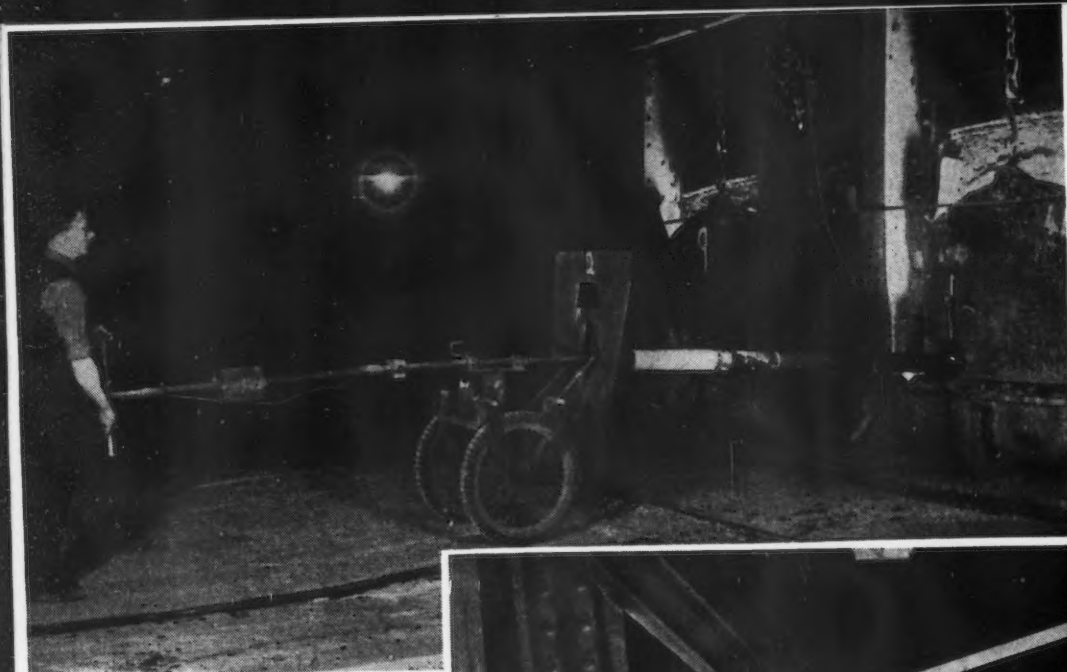
The arm is mounted on a two-wheeled trolley with pneumatic tires. A counterbalance weight and a swivel mounting give ease of manipulation and balance. A typical arm is shown in fig. 4.

## Back Wall Installation

Each of the foregoing types has been in use at various steel plants in Britain since 1940 with steady improvements in design. They have proved effective instruments in furnace control, but did not quite fulfill all the required conditions. Recently a semipermanent back wall thermocouple arm has been put into service at the Steel, Peech and Tozer plant of United Steel Co.'s Ltd., Sheffield. This installation requires a minimum of maintenance, is comparatively cheap to install, gives a rapid and accurate record in 10 to 15 sec, can be operated by one man, is robust enough to stand up

FIG. 3—Thermocouple in use in conjunction with a dial indicator. In this larger type the last 6 ft or so are externally insulated.

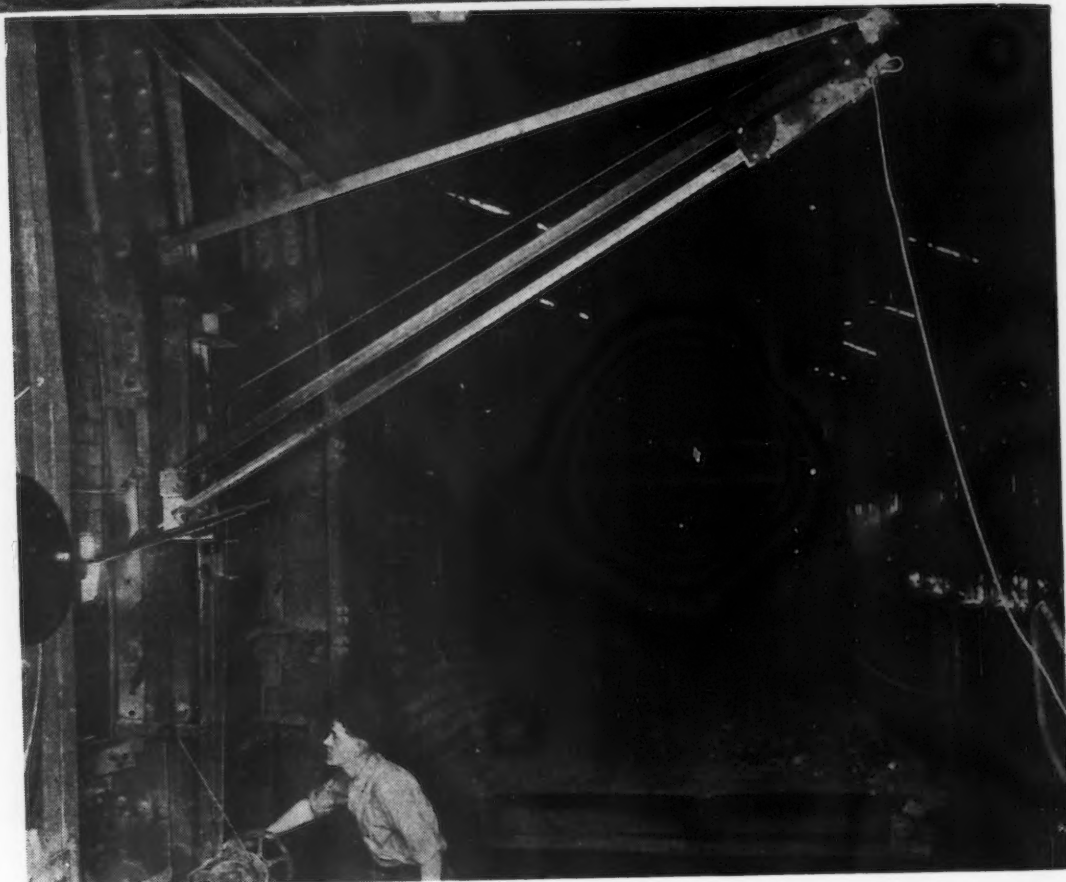




ABOVE  
FIG. 4—A thermocouple arm mounted on a two-wheel trolley with pneumatic tires.

o o o

RIGHT  
FIG. 5 — A semi-permanent back wall thermocouple arm in service at the Steel, Peech & Tozer plant at Sheffield.



to steel plant conditions for long periods, is out of the way of obstacles such as charging machines, does not impede furnace operations, and reduces human error to a minimum. Two types have been tried out with satisfactory results and fig. 5 shows one of these in use.

The experimental arm consisted of a heat-resisting steel tube about 10 ft long protected for the whole of its length externally by graphite sleeves. The rare metal wires are run through twin-bore fireclay insulators. These insulators (with wire threaded) are housed in a lighter steel tube of suitable diameter to fit snugly into the outer tube and held in position by a set screw. This inner tube is completely retractable and, when necessary, a complete new internal assembly can be inserted in a few minutes. The hot junction end is completed as in the earlier types except that a slightly different method of attaching the silica sheath is employed. These sheaths, 4 in. long x 0.24 in. bore and 0.04 in. wall thickness are molded into a plug of plumbago and silica cement. This plug is manually

inserted into the hole in the last graphite sleeves and a slight twist makes an effective seal. The opposite end terminates in a suitable couple head from which detachable leads are taken to the indicator and recorder. Details of this arm assembly are shown in fig. 6.

The latest arm is an all-steel one with no external insulation. This is a hollow steel bar, about 1 3/4 in. diam to give the necessary rigidity. The wires run

through large twin-bore insulators which fit snugly into the hollow bar. The additional weight is of no consequence as this is carried by a jib and the arm retracted mechanically after use. Both types of arm have an indefinitely long life, the only regular maintenance being renewal of the silica sheath after each immersion and of the hot junction after 15 immersions.

The thermocouple arm is mounted on a swinging jib attached by hinges to the back wall furnace binding. When not in use it swings parallel to the back wall of the furnace.

For an immersion, the jib is swung into position, and the couple arm, suspended from the rail by two pairs of rollers, runs down at a predetermined angle of 30° through a suitable hole in the furnace back wall and into the bath. With different types and sizes of furnace the length of arm is adjusted to give an immersion depth of 9 in. into the steel for the hot junction. Maximum temperature is reached in 10 to 15 sec. This temperature is shown on a large indicator on the furnace platform and a written record simulta-

neously registered on the recorder in the office or laboratory.

In some steel plants an adjustable time delay switch is fitted which operates a hooter or siren after a predetermined interval of, say, 10 sec as a signal for withdrawal of the thermocouple. This is retracted by a small hand winch, the old sheath removed, a new one attached and the instrument is ready for further use.

Experience with this type of instrument has given complete satisfaction. Temperatures taken simultaneously with the usual type of immersion couple have shown a maximum discrepancy of  $\pm 5^{\circ}\text{C}$  ( $9^{\circ}\text{F}$ ). Fig. 7 shows the construction of the jib and arm. The back wall type is readily adaptable to most types of open-hearth and many electric furnaces.

### Steel Arm and End Block

The earliest type of arm insulation consisted of blocks or sleeves of diatomaceous material. The end block rapidly eroded by basic slag and was replaced by one of graphite.<sup>3</sup> This was a considerable improvement and the graphite blocks had lives of 200 to 300 immersions. However, some trouble was experienced with embrittlement of the couple wires which was in part due to the proximity of graphite. Investigations into the embrittlement and contamination of thermocouple wires by several investigators revealed the reasons for this trouble and the results are in the course of publication. The replacement of the graphite arm or block by mild steel has resulted in the disappearance of embrittlement at the works with which the author is associated. These steel units have given surprisingly good service. In use they acquire a coating of slag which persists sufficiently long to protect the arm from attack during the brief immersion, and which is easily removed on withdrawal. One steel end block has been used over 1000 times and is still in use. There may be conditions or types of slag under which the steel arm would not be suitable, in which case graphite sleeving would have to be used.

The speed of temperature measurements requires measuring instruments of special design. The simplest indicator is of the millivoltmeter type, such as that designed by the Cambridge Instrument Co., Ltd., with a very rapid response and a high internal resistance. Such an indicator can only be used, however, where the external (thermocouple) resistance varies by less than 1 ohm. Indicators still have a limited field of service.

### Measuring Instruments

Potentiometric measurement has been widely used since the inception of quick immersion technique, the accuracy being independent of changes in thermocouple resistance. This simplified the construction by allowing long couple wires to be used. One type made available by Negretti & Zambra, Ltd., has a reflecting galvanometer having a period of  $1/5$  sec. The instrument is robust enough for works use and has a very open scale. A fitted scale reads directly in temperature over the range  $1400^{\circ}$  to  $1700^{\circ}\text{C}$  ( $2552^{\circ}$  to  $3092^{\circ}\text{F}$ ), when a platinum and 13 pct rhodium platinum thermocouple is used. Another type developed by the Cambridge Instrument Co. is a light, accurate and compact instrument which makes use of a pointer type of galvanometer.

The ideal in a complete steel temperature installation is to incorporate temperature indicators and automatic recorders. These conditions are fulfilled by such an equipment as that of the Tinsley (Industrial Instruments) Ltd.<sup>7</sup> A simple and robust amplifier<sup>8</sup> converts the emf from the immersed thermocouple into a strictly proportionate current large enough to deflect large indicators on the furnace platform and a recorder in the office or laboratory. In the amplifier the output current is a strictly linear function of the input voltage and the amplification is constant to within 0.1 pct. It is operated from ac sources and is independent of fluctuation of the supply voltage and frequency. The input current being negligible, variation in resistance of the input circuit has no effect on the

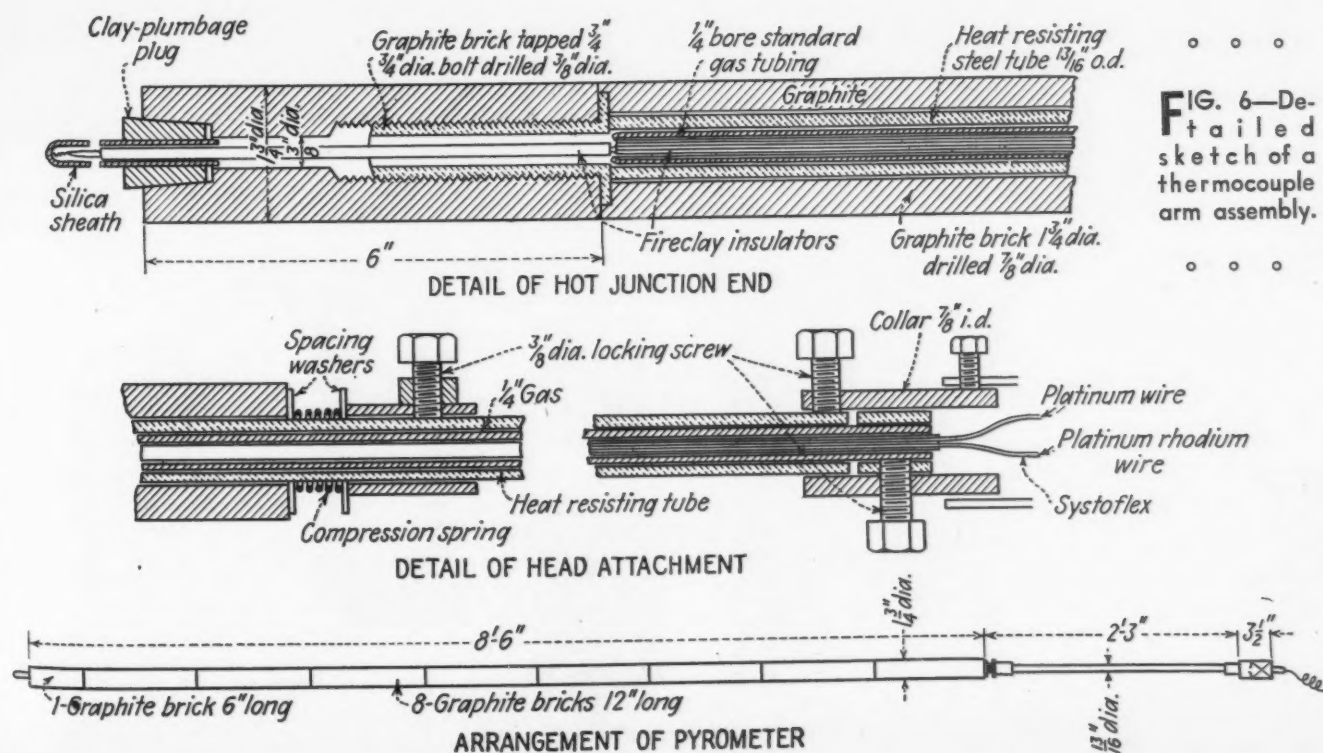
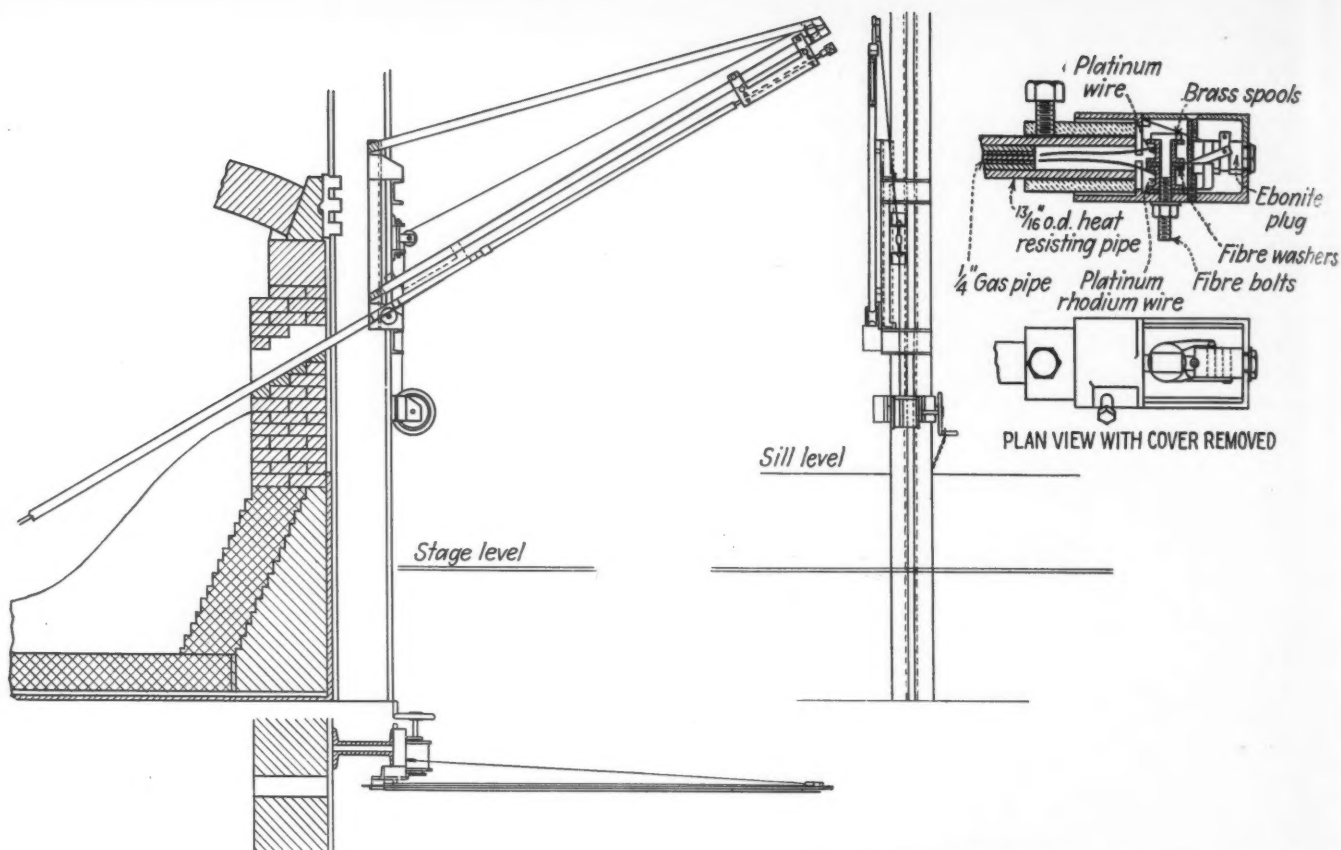


FIG. 6—Detailed sketch of a thermocouple arm assembly.



ABOVE  
FIG. 7—Sketch of the construction of the jib and arm of the back wall immersion pyrometer.

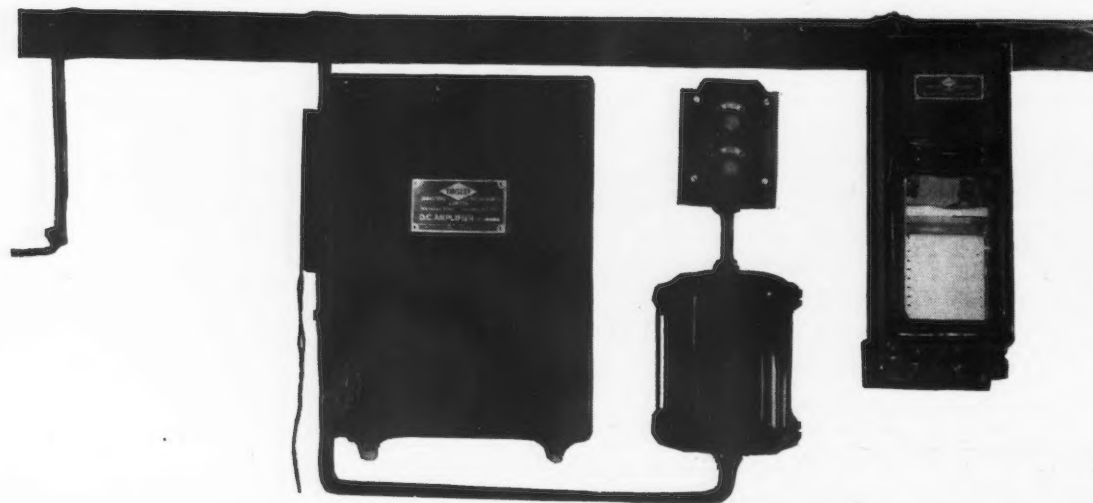


output. The calibration is also independent of valve characteristics, photocell and light source. Fully automatic cold junction compensation is fitted.

A circuit is included to give calibration against two standard output currents, proportional to two temperatures. This is normally carried out by relays which are operated by push buttons. The accuracy of the large measuring instruments may thus be checked and maintained over a number of years when used under industrial conditions.

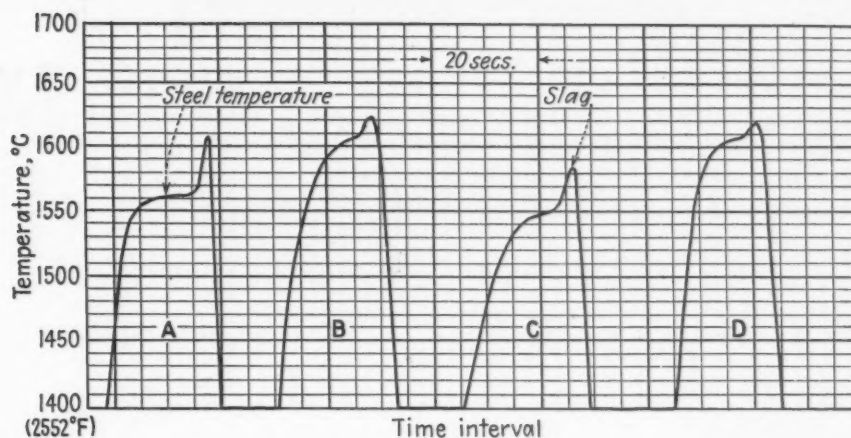
From the foregoing it is obvious that the instruments may be mounted any distance from each other without affecting the calibration.

The recorder has a 3 1/2-in. evenly divided scale, electrically driven roll chart which commences to run at a speed of 3 ipm when the thermocouple is immersed. A typical chart is illustrated in fig. 9. The arrow A shows the point where the thermocouple has reached the temperature of the liquid steel. When the couple is retracted, it passes through the liquid slag



LEFT  
FIG. 8—The indicator, amplifier and recorder used with a back wall immersion pyrometer.

FIG. 9—A typical chart produced by the recorder. Retraction of the thermocouple through the liquid slag (at a higher temperature than the steel) causes the steep rise at the end of each record.



which is at a higher temperature than the steel and causes the steep rise at the end of each record.

The type of installation embodying a semi-permanent back wall thermocouple, amplifier, indicator and recorder is an ideal combination for temperature control in a modern plant. The operation is of great simplicity and does not require a skilled technical staff. The cost per immersion is very low and the maintenance is of a very small order, too. Figs. 3 and 8 illustrate an indicator in use, the amplifier and recorder.

Regarding the practical application of the temperature measurements, much work has already been done. Temperature distribution in the furnace bath has been explored<sup>9, 10</sup> and found to be within narrow limits when the bath is active, though steep gradients can be set up when the metal is quiescent. The effect of temperature control upon quality has also been investigated<sup>11, 12</sup> and shown to be an important factor in this respect. Skulls, cracks, inclusions, lapped or faulty castings, blown ingots or castings can be largely overcome by avoidance of extremes in tapping temperatures.

As to the accuracy of the results it is estimated that this would be within  $\pm 10^{\circ}\text{C}$  ( $18^{\circ}\text{F}$ ) including instrumental errors and lack of uniformity in the steel bath if both these factors operated in the same direction. In most normal cases the accuracy would probably be  $\pm 5^{\circ}\text{C}$  ( $9^{\circ}\text{F}$ ).

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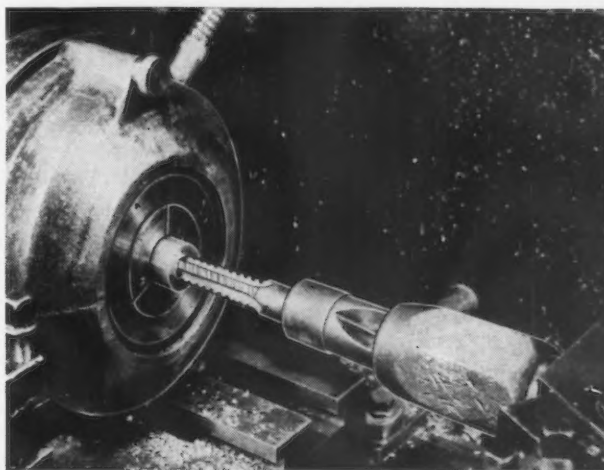
- <sup>1</sup> F. H. Schofield, First Report on Quick Immersion Methods of Measuring Temperature of Steel in the Open Hearth Furnace, Seventh Report of Heterogeneity of Steel Ingots, Iron and Steel Institute, 1937.
- <sup>2</sup> F. H. Schofield and A. Grace, Eighth Report of Heterogeneity of Steel Ingots, Iron and Steel Institute, 1939.
- <sup>3</sup> Third Report of Liquid Steel Temperature Sub-Committee, Journ. Iron and Steel Inst. No. 1, 1942.
- <sup>4</sup> "Temperature of Molten Steel," THE IRON AGE, Feb. 22, 1945.
- <sup>5</sup> "Temperature of Steel Bath Measured in 5 Seconds," Blast Furnace and Steel Plant, June 1945.
- <sup>6</sup> H. T. Clark, Iron and Steel Engineer, September 1945.
- <sup>7</sup> D. C. Gall, Journ. Inst. of Electrical Eng., 1942.
- <sup>8</sup> F. L. Steghart, Amplifier, U.S.A. Patent No. 2,329,423.
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- <sup>12</sup> Discussion on No. 9.
- <sup>13</sup> H. T. Clark, Iron & Steel Engineer, February 1946.

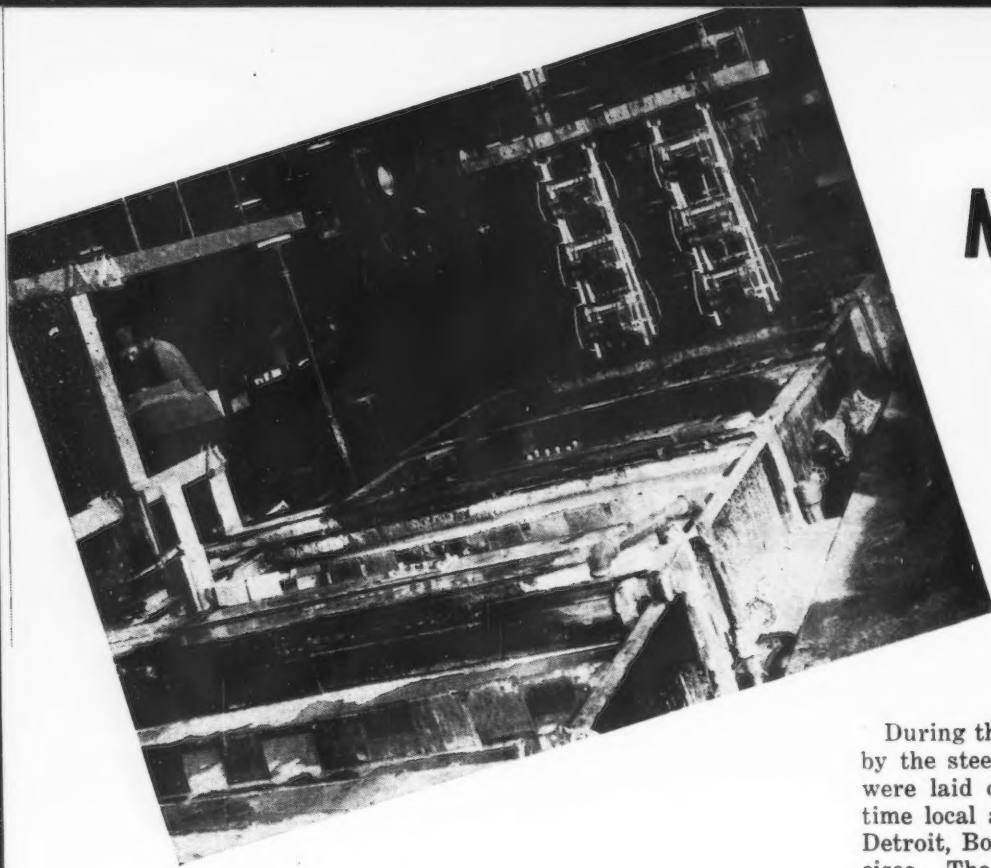
## Tapping Quadruple Acme Threads

PRODUCTION of quadruple Acme threads has been greatly simplified at the Westinghouse Electric Corp. plant, East Pittsburgh, by the introduction of a new method of tapping. The nuts are made from bronze, and have a  $\frac{3}{4}$ -in. ID, an OD of 1.120 in., and are  $1\frac{7}{8}$ -in. long. The thread is a  $29^{\circ}$  quadruple Acme with a 1-in. lead and a  $\frac{1}{4}$ -in. pitch.

When the nut was first put into production an attempt was made to chase the thread on a lathe with a single point tool. The percentage of scrap, however, was so high that a series of five taps was developed to do the job. As in the original method, the steps in making the nut are, cut off, drill, face and thread. Instead of chasing the thread in a lathe, however, it is now tapped on a Universal turret lathe in five steps. To facilitate tapping, the thread is tapped to  $\frac{3}{4}$  of the full depth. The taps are run into the nut, and as each is removed from the chuck it is dipped in kerosene to remove the chips. Notches cut into the shank of the taps aid the operator in using them in the proper sequence.

The same method has also been applied to a double thread in monel metal that could not be chased successfully with a single point tool.





## Metal Finishers

Mr. Shock outlined the formation of a National Association of Metal Finishers to include platers, enamelers, and rustproofers. After extended discussion, it was voted to proceed with such an organization and to set dues on a graduated scale based upon the capacity of the member firms. The national association will be composed solely of local groups in various parts of the country and individual firms will join their nearest local association.

During the next morning, another meeting was held by the steering committee at which ways and means were laid out for the organization. At the present time local associations are functioning in New York, Detroit, Boston, Chicago, Los Angeles, and San Francisco. The national association will aid in the formation of new local groups as rapidly as possible.

One of the local groups to be formed will cover the Mississippi Valley, including in its territory, Missouri, Kansas, Oklahoma, Texas, Louisiana, Arkansas, Western Kentucky, Tennessee, and Southern Illinois. The prime mover in this organization will be Edward Musick, of St. Louis. Organizing this group will be a tremendous job, but as Mr. Musick is a past president of the American Electroplater's Society, a past chairman of the job platers meetings at the national conventions, and one of the best known job platers in the United States, his influence will undoubtedly be effective in organizing this broad group. All interested platers in the territory described may communicate with Edward J. Musick, Musick Plating, Inc., 206 South 9th Street, St. Louis.

The more than 1000 registrants at the meeting participated in technical sessions which covered an unusually wide range of subjects, reflecting the broadened scope of metal finishing generally. Abstracts of some of the papers presented at the educational sessions follow.

ONE of the outstanding events of the recent convention of the American Electroplater's Society was a meeting of job platers held on June 18, at the Hotel William Penn, Pittsburgh, attended by 88 platers from all parts of the United States. The chairman was Edward J. Musick, Musick Plating, Inc., St. Louis, who presided in the absence of R. J. O'Connor, of the Contract Plating Works, Bridgeport, Conn., who was unable to attend because of illness.

The official business was divided into two sections: First a report by Adolph Bregman, of New York, reviewing the progress of the job plating industry during the past year, and second, a report by Raymond M. Shock, of Detroit, on a plan for a proposed national association.

Mr. Bregman stated that during the past year, the industry as a whole had prospered, but was faced with a number of postwar problems such as a shortage of skilled polishers, miscellaneous plating materials, especially buffs and silver. He also mentioned cadmium and chromium chemicals as other materials that are hard to obtain.

## Observations on Alkaline Electrotinning

By T. C. TIMBY

*Jones & Laughlin Steel Corp., Pittsburgh*

ALL tinplate manufacturers have, at times, been made aware of a difference in corrosion resistance between two apparently comparable lots of plate, but no one as yet appears to have arrived at the final answer. The economic future of electrolytic tinplate will depend in no small degree on the solution of this problem.

Up to now certain facts have been observed which suggest that this variable corrosion resistance is due

to the intermittent occurrence of something in or on the surface of the steel base or possibly to some unrecognized surface condition of the steel base. Plate of both very good and of less satisfactory corrosion resistance has been produced so close together in point of time that it appears extremely unlikely that pickling and plating conditions could have materially changed in the elapsed time interval. If alkaline electrolytic cleaning is introduced prior to pickling, some improve-

# Plan National Association . . .

ment in the general average is effected. Certain indirect tests suggest that if plate of mediocre corrosion resistance had been rather heavily pickled prior to tinning, its corrosion resistance would have been brought up to a satisfactory level.

A variation in heat treatment from the conventional procedure has also been tried. Coils of plate have been split and both halves processed as usual except that one half of the lot was normalized instead of receiving the conventional anneal. The normalized stock was by far the better in corrosion resistance. It has also been found that continuous annealing effects an improvement. It appears that the higher temperatures involved in both of the above tend to remedy some condition with which the conventional anneal does not always cope. From the evidence thus far available it is concluded that the earlier stages of tinplate processing, prior to heat treatment, should be re-examined.

All of the acid type solutions make use of tin in the stannous form. The alkaline solutions, on the other hand, deposit tin preferably from the stannate or oxidized form. Theoretically, twice as much tin per ampere hour, can be deposited from the stannite solution as from the stannate. An addition agent that would permit satisfactory deposits from an alkaline stannite solution might have interesting possibilities.

Two types of alkaline solutions are in commercial use, the sodium and the potassium. Solution control has been found to be largely a matter of maintaining that concentration of free caustic which accumulated experience has shown gives the most generally satisfactory operating conditions. If the free caustic con-

tent is held at about 30 to 35 g per liter, the tin will more or less take care of itself and the equilibrium

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**Formation of a National Association of Metal Finishers, to include platers, enamellers and rust-proofers, proposed at 33rd annual meeting of American Electroplater's Society. Educational sessions at convention cover wide range of finishing problems, including research, electroplating, electropolishing, organic finishing, X-ray diffraction, coloring magnesium alloys, and liquid buffing compounds.**

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range appears to be around 45 to 55 g per liter; this at an operating temperature range between 190° and 200°F.

Since tin is a high priced and restricted raw material, it is imperative to guard against tin losses. Sometimes an entirely obvious leak is dismissed as insignificant when a little investigation would show it to be otherwise. Drag-out is another source of tin loss that requires careful watching and prevention is more profitable than any attempted recovery. Anode design has an important bearing on anode behavior. In the author's opinion, horizontal casting in an open top mold is to be preferred for anodes. Some experimental work was done with anodes of varied shapes, in which anodes of keystone shape showed some promise.

## Coloring Magnesium Alloys

By P. R. CUTTER

*Hanson Van Winkle-Munning Co.,  
Matawan, N. J.*

MODERN designers have been aware of the desirable properties of magnesium alloys for some time, but in many cases have hesitated to use it for the lack of a more suitable finish. Just as the better-known steel and aluminum alloys possess certain inherent weaknesses which must be overcome by the application of suitable protective finishes before they may be put into actual service, so is this true with magnesium alloys. There are perhaps four major limitations that a finish for magnesium alloys must overcome. These are: (1) Protect the metal from the attack of chlorides or other corrosive environments; (2) produce a slightly acid nonmetallic surface to dominate the tendency of the metal to develop alkalinity, thus insuring a good paint base; (3) protect the relatively soft metal from wear and abrasion, and (4) insulate the magnesium alloy parts from galvanic corrosion attack or their tendency to develop a couple when brought in contact with a dissimilar metal.

The chrome-pickle and the acid-dichromate processes

which in the past have been relied upon as satisfactory finishes, have proved sufficient to overcome the first two shortcomings, but have offered little in correcting the remaining deficiencies.

The Consolidated Vultee Aircraft Corp. realized the need of a better protective finish to process the huge quantities of magnesium alloy parts involved. To meet this demand, a new process was developed and put into production, which through extensive testing and actual use has proved itself very effective in producing an all around protective coating on magnesium alloys. The new process was originally referred to by the above company as CVAC No. 1, but is now being offered through license as the Manodyz process by the Hanson-Van Winkle-Munning Co., Matawan, N. J.

The Manodyz Process is an electrolytic method which forms a highly protective and decorative magnesium oxide-silicate film on the surface of magnesium alloys. The function of the coating is similar to the

aluminum oxide films on anodized aluminum alloys.

After the magnesium parts are thoroughly cleaned, they are subjected to either a low voltage alternating or direct current in a film forming electrolyte containing caustic soda with organic and inorganic additives. The same bath formula is used with either a low voltage ac or dc current, but the properties of the derived coatings show some variations. After application, the protective coatings are then processed for proper paint adhesion or colored with organic acid dye solutions.

The abrasion resistance, galvanic corrosion resistance and paint adhesion of the resulting finishes have made the Manodyz Process highly desirable for applying protective coatings to magnesium parts for military aircraft. As a result of their decorative properties which may be greatly enhanced by the application of dye coloring, the Mandoyz coatings are now being used by manufacturers of magnesium consumer goods.

The paper gives considerable data on the coating: physical properties, including natural color and dye coloring, film thickness, porosity, brightness, hardness, abrasion resistance, toughness, penetration resistance, heat resistance, dielectric strength, throwing power, and comparisons with anodized finishes; chemical properties, including composition of the coating, resistance to chemicals, action as a paint base, resistance to paint embrittle-

ment, etc. Corrosion resistance is high, ranging from 30 hr for the unsealed coat applied by direct current, up to 2000 hr for parts Manodyzed, zinc chromate dipped and sprayed and one spray coat of aluminized lacquer to a total depth of 0.001 in.

One of the main limitations in the use of magnesium alloys is their tendency to develop a couple when brought in contact with dissimilar metals, due to the difference in solution potential between magnesium and the other alloys. This tendency to develop a couple can be greatly overcome by first applying an insulating finish to the magnesium alloys. When the highly dielectric Manodyz finishes have been properly sealed they offer considerable improvement over the conventional dichromate finishes in correcting this shortcoming of magnesium alloys. The protection offered is greatly enhanced if both the Manodyzed magnesium parts and dissimilar metal parts are given two coats of zinc chromate primer to a total depth of approximately 0.0008 in. before assembling. The use of 56S aluminum alloy rivets in making such assemblies

is recommended.

Based on excellent test results obtained by an extensive study of dissimilar metal contact corrosion, the Manodyz ac and dc processes have been recommended by the Army as satisfactory alternates for specification AN-M-12, type 111, acid dichromate treatment.



**W**ALTER L. PINNER, president, American Electroplaters' Society. Mr. Pinner is associated with the Hou-daille-Hershey Corp., Detroit.

## Liquid Polishing and Buffing Compounds

By H. J. McALEER

Formax Mfg. Co., Detroit

**A**PPPLICATION of the correct amount of buffing compound at the correct time, without being wasteful, on automatic buffing machine operations has long been a serious and costly problem. On many operations the polishing machine will be running two or three different size wheels both in diameter and width as well as degrees of hardness. Special and odd shaped bars of buffing compounds are required on the same machine.

With this method the large stubs or nubbins of buffing compound that are left unusable, add considerably to the cost. Further, disadvantage of these special length and odd size bars is the necessity of carrying larger inventories because the compound manufacturer finds it necessary to make each order up as received.

The development of polishing and buffing compounds in a liquid form that can be sprayed on the buff or polishing wheel has eliminated these disadvantages at a considerable saving. This new process is not limited to automatic buffing machines as it has been applied also to hand and semi-automatic buffing operations.

The equipment required is—(1) Necessary air supply; (2) air regulator or transformer to reduce the

main line pressure; (3) pressure tank and reservoir for storing the compound under pressure; (4) spray gun head mounted near the buffing or polishing wheel; and (5) either foot or automatic cam or electric release valves to spray the compound to the buffs or the work.

Since the compound is in a liquid form the cutting action of the abrasive is not cushioned by the surrounding, ordinarily used, higher melting point greases such as found in bar or cake compounds. This results in far faster cutting down and coloring action. It is not unusual to find a reduction of 50 pct by weight in compound savings because the spray-mist of liquid compound applied can be so regulated that it is applied only in the amount required. Further advantages include the increase of as much as 25 pct of buff life as the "compound head" is constantly maintained.

The labor costs are reduced and production is increased because there is no lapse of time in fitting bars to buffing compound applicators and changing them. In the case of hand buffing the liquid spray application is controlled by the operator's foot and both hands are free at all times to handle the work.

There is no reasonable limit to the number of spray guns that can be operated from one single pressure reservoir tank. There is a wide selection of these liquid buffing compounds available for use on all metal surfaces.

Another very important point of advantage to the plater is the fact that these liquid buffing compounds are easily cleaned from the buffed work. Being in liquid form the compound does not crystallize hard on the work or pack solidly down in crevices and recesses.

## X Ray Diffraction Studies of Electrodeposits

By T. VOYDA

*Pratt & Whitney Aircraft Div.,  
United Aircraft Corp.*

X RAY diffraction, a subject still unfamiliar to the majority of platers, is a technique that should not be overlooked in the solution of certain problems which are impossible or impractical of solution by other methods. Plating chemists at Pratt & Whitney aircraft have utilized X ray diffraction to solve many problems connected with their work.

One application of X ray diffraction was the study of lead-indium diffusion alloys as used in aircraft engine bearings. This surface is prepared by plating a thin (approximately 0.001 in.) coating of lead on silver, followed by a much thinner plated coating of indium on the lead. The bearing is then heated for the purpose of diffusing the indium into the lead. Chief interests were the distribution of the indium in the lead at various depths of plate, extent and type of solid solution in heated and unheated specimens, variation of indium concentration in the alloy with variations in heating time.

X ray diffraction methods were used for the study because the nondestructive nature of the method afforded opportunity to observe the same specimen in various stages of treatment. The method was also particularly convenient for study of a thin surface layer without serious interference from sub-surface layers.

The method depends upon the fact that the lattice parameter of lead varies as indium atoms replace lead atoms in the lattice structure of lead. The resultant distortion causes a shift in the diffracted beams. From the amount of shift, as recorded by the photographic film, the lattice parameters of the cast lead and lead-indium alloys are calculated. Results showed that the parameter of lead-indium alloys varies linearly with the percentage of indium.

The plated indium layer was found to diffuse rapidly even at room temperatures. Greatest concentration of indium in solid solution is at the surface of the lead-indium layer. Indium content of the lead gradually decreases to small percentage of original total if heating is sufficiently prolonged. In specimens heated for long periods, the underlying silver is found to contain a high indium concentration.

Extensive work has been done on methods of producing good bond of plated metal to base metal, but little knowledge exists as to the mechanism by which adherence is maintained. Flash electrolytic deposits of copper on steel, silver on steel, nickel on steel, silver on copper on steel, and silver on nickel on steel, as well as immersion silver deposit on copper on steel, were

studied. Polished steel specimens with metal flashes were also studied. Cobalt radiation was used. Some interesting points were observed regarding structure of the flash deposits.

In bonding of electrodeposits to a base metal, three types of bonds are generally observed:

(1) Mechanical bond, in which the deposit assumes at once its own characteristic lattice both as to size and dimension and follows the microscopic (or smaller) contours of the base metal atoms to exercise a strong force on adjacent atoms of the deposit.

(2) Solid solution or intermetallic type of bond, in which a transition layer exists at the interface between normal base metal and normal deposit.

(3) Pseudobasal isomorphic type of bond, in which the coating assumes the crystalline type and dimension of the base metal even though this structure may be foreign to the normal electrodeposit structure.

In the present work, nickel on steel and immersion silver on copper flash exhibited the pseudobasal isomorphic type of bond while all other flash deposits gave the mechanical type. No solid solution type bonds were observed; no apparent diffusion took place. It should be noted that immersion silver on copper which may produce a poor bond gave one type of structure while deposited silver on copper gave another. The case of nickel on steel following the structure of the steel, in contrast with the case of copper assuming its own structure under similar conditions, is also noteworthy.

X ray diffraction has proved advantageous in the investigation of electrodeposited alloys. Thin deposits may be examined for chemical composition and structure without stripping from the base metal. The same specimen may be repeatedly checked to detect changes resulting; for example, from aging or heating. Small local areas may be examined. Thus a better knowledge of homogeneity of the deposit may be gained, since compositions and structures may vary, as for instance, between a burnt edge and a shiny portion of the same specimen.

Tin alloys containing 2 to 6 pct copper were plated from a fluoborate bath. Results for an "as plated" deposit (2.6 pct Cu) showed only the distorted tin lattice in the pattern, indicating apparent complete solution of the tin. This condition differs from that found for thermally prepared alloys of the same composition where little or no solid solution of tin in copper occurs; instead of compound,  $\text{Cu}_3\text{Sn}$ , is formed.

Heating the deposit in oil at 340°F for four hours caused development of the pure tin lattice with new lines in the pattern indicating the formation of the copper tin compound.

The lead-tin alloys were also plated from a fluoborate bath. Alloys plated at 30 amp per sq ft containing 5.2

pct tin showed patterns indicating that all the tin was in solution. The latter condition is metastable, since for thermally prepared alloys at equilibrium only up to 3.5 pct, tin is soluble in lead at room temperatures. It is of interest to note that current density conditions can influence the extent of solid solubility.

## Two-Element Balancing Machine Incorporates Automatic Drill

**C**OMplete, semi-automatic equipment for measuring and correcting unbalance in automotive type crankshafts has been developed by the Gisholt Machine Co. of Madison, Wis. The equipment consists of two electrically connected machines, the first of which is a Gisholt Type C Dynetric balancing machine, and the second, a multiple spindle drill press. This two-element unbalance measuring and correcting equipment provides a means whereby the entire balancing process can be completed on automotive crankshafts with a minimum of physical and mental effort, to a high degree of accuracy.

Generally, the balancing machines available for measuring unbalance effects in crankshafts are of a universal nature which provide for measurement of the amount and angular location of unbalance in each of two planes perpendicular to the rotational axis. By the use of charts, or by trial and error methods, the balancing machine operator determines the amount of metal which should be removed from the permissible correction points. The balancing machine operator marks on the crankshaft the amount and position of the drilling corrections which should be applied to give balance to the shaft. The marked crankshaft is then passed on to a drilling machine operator for correction.

The Gisholt Type C Dynetric balancing machine is arranged to indicate directly the amount of metal which should be removed from specific points in a crankshaft in order to produce balance. The points for unbalance correction are determined only by the limitations of the crankshaft.

The machine can be arranged to measure the exact amount of correction which should be applied to give both static and dynamic balance. These indications are electrically transmitted to a six-spindle drilling machine. In this machine, the spindles are arranged so that holes can be drilled at the permissible points of correction. The depth of each hole is automatically set from the corresponding balancing machine measurement.

The balancing machine controls consist of a pair of selector switches and six weighing dials which are numbered to correspond with the correction points on the crankshaft. The selector switches and weighing

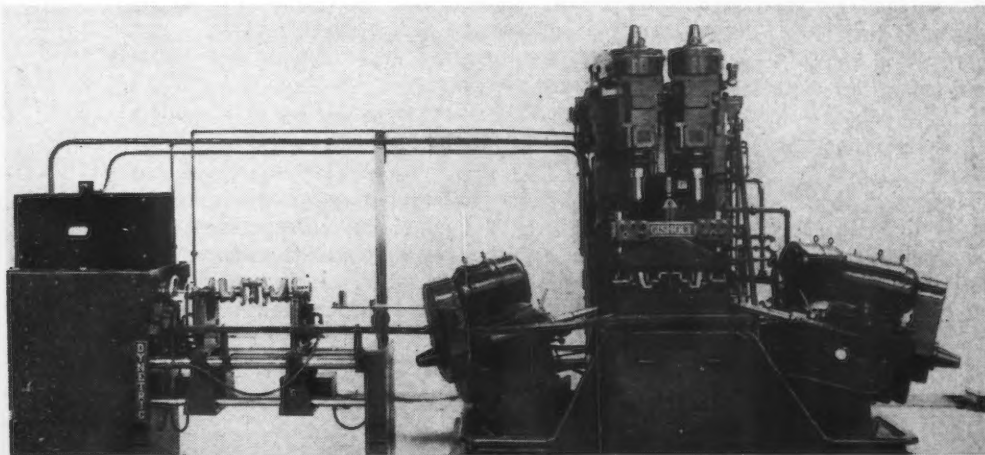
dials are turned in sequence to cause a meter on the balancing machine to read zero. When the last weighing dial has been turned, the driving coupling is removed from the crankshaft. The crankshaft is then raised hydraulically so that the operator can easily slide it onto a dolly. It can be moved onto the dolly only when its angular position is such as will later permit it to be moved into the drill without difficulty. When the dolly is loaded, it is unlatched and moved to the correction drilling machine.

When the dolly has arrived at the correction drilling machine, the crankshaft is in proper angular position to be moved directly into the drill. It can enter the drilling fixture in only one angular position so that it is positioned properly. The correction drilling cycle is started by simultaneously pushing two start buttons, one with each hand.

When the traverse motion of the drills is initiated, a depth gage contacts the cam on the receiver and so gets the depth measurement required for the drilled hole. The drill will repeatedly produce holes to the same depth, for the same receiver setting, to an accuracy of 0.003 in.; this represents a correction error of less than 0.05 oz-in. The drilling unit and depth control were made by the Leland-Gifford Co. of Worcester, Mass.

Three seconds after the drilling cycle is started, the receiver information has been transferred to its drill spindle so that the weighing dials and transmitters on the balancing machine can be reset without changing the settings of the correction drills. This makes it possible for a balancing machine operator to be determining the amount of correction in a crankshaft while the drill operator is correcting a shaft in which unbalance measurements have been previously determined. A green light on the balancing machine advises the operator when the drilling machine has picked up information concerning the previously measured crankshaft.

Some of the drills on the correction machine cannot be seen by the operator. On the control panel, there is provided a numbered red light for each of the drill spindles. When any drill becomes dull, the red light associated with that drill spindle will be turned on by means of a hydraulic pressure switch. This light will stay on until the drill has been changed and the pressure switch manually reset.



**G**ISHOLT combination balancing machine and drill press for measuring and correcting unbalance in automotive type crankshafts.

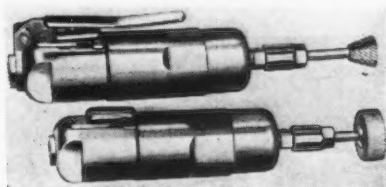
# New Equipment...

## Small Tools and Gages

**Recent improvements in rotary and thread grinders, diamond wheels, milling cutters and guards, and holding fixtures are described in this week's review. Measuring instruments such as thread gages, surface comparators, stroke counters, angle computers and inch converters are among other shop instruments in this summary.**

**I**DENTIFIED as the type VV, a series of hardened and ground die heads, available in 1, 1½, 2 and 2½-in. sizes for use on hand operated threading machines has been added to the line produced by the *Landis Machine Co.*, Waynesboro, Pa. These heads are recommended for threading alloy steel and for work which must be held to extremely close tolerances. All parts are made from special alloy steel, precision ground to assure maximum accuracy. The chaser holders are clamped to chaser holder slides

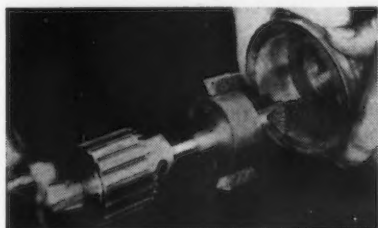
chips that may be formed are blown away by the exhaust of air from



ports at the chuck end of the grinder, leaving the work clear for observation at all times. Either lever or button type control is available.

### Power Brushes

**F**OR removing insulation, rust, mold marks and for many operations requiring deburring, cleaning or finishing small diameter inside surfaces, a series of Situft power brushes and holders has been developed by the *Osborn Mfg. Co.*, 5401 Hamilton Ave., Cleveland. These brushes utilize a principle of wire suspension under pressure and are equipped with a variety of holding tools designed for use in drill presses, bench grinders and other production and deburring tools. They are made of high-grade



crimped wire and have from ¼ to 1¼-in. OD. A kit containing 12 different size brushes and two sizes of holders is available.

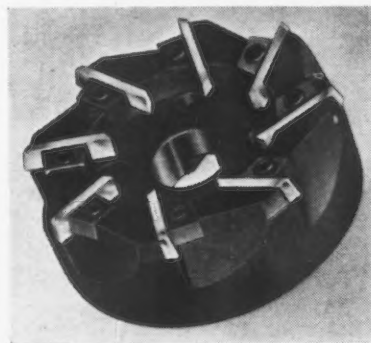
### Portable Thread Grinders

**G**RINDALL portable, precision thread grinders have been designed and built by *Walz & Kren-*

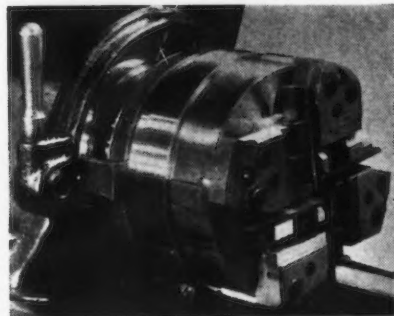
*zer, Inc.*, Rochester 7, N. Y., for use on lathes, shapers, milling machines and boring mills. These tools are sturdily built with consideration given to the proper distribution of mass weight in order to reduce vibration to an absolute minimum. This feature combined with the perfectly balanced ball bearing spindle and constant speed motor, is said to assure greater grinding accuracy. The spindle can be quickly and easily adjusted for operations requiring a helix angle in thread grinding. Grinders can be equipped with either a V type or standard Acme thread wheel dresser.

### Face Mill

**C**ALLED the Universal Face Kennamill, a milling cutter which consists of a precision built



heat treated steel body, or tool holder, with a set of detachable solid blades mechanically held in position, has been announced by *Kennametal, Inc.*, Latrobe, Pa. Five standard sizes are available, 4, 6, 8, 10 and 12-in. diam. Blades for these are of the same cross section, and when shortened by regrinding, can be used in smaller cutters successively. They are formed at both ends, permitting use in either right or left hand cutters. The face mill can be adapted for milling different



of heavy cross section to assure maximum rigidity, and permit the removal of the holders from the face of the head for interchange without disassembling any part of the head or removing the head from the spindle.

### Rotary Grinder

**A**SMALL, lightweight pneumatic file and die grinder has been announced by the *Ideal Industries, Inc.*, 1925 Park Ave., Sycamore, Ill. The tool is 6½ in. long x 1½ in. in diam and weighs 16 oz. It is rated at ¼ hp, 19,000 rpm (90 psi), with a maximum speed of 25,000 rpm, reached through use of a vane type motor, the same as used in large size pneumatic tools, and is said to maintain its speed even under heavy loads. The harder it is worked, the cooler it becomes. All dust and

materials by interchanging blades. Those having the proper grade of carbide and suitable cutting angles are wedged in the body at fixed angles. Dull blades may be removed from the body while it remains on the spindle, and sharpened on a standard surface grinder.

#### Diamond Abrasive

**A**VITRIFIED bonded diamond abrasive has been added to the line of diamond abrasives produced by the *Bay State Abrasive Products Co.*, 21 Union St., Westboro, Mass. Advantages of vitri-



fied bonding are said to be great strength and rigidity, plus faster, cooler cutting action. A wide range of standard shapes and sizes has been produced.

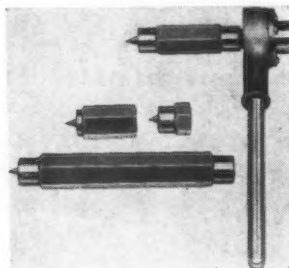
#### Cut-Off Saw Attachment

**K**NOwn as Saw-Matic, an attachment that converts manually operated metal cut-off saws to full automatic operation has been developed by *Machine Specialties*, 4029 N. Kedzie Ave., Chicago 18. Saw-Matic is a complete package unit, ready for installation by shop workers in a few hours time, it is claimed. The unit is said to cut any length from 3/16 in. up, automatically, and will saw all day without an attendant. Consistency in length of cut to 0.010 is achieved by a special friction pull-up device and an especially sensitive valve, so that the last piece sawed is the same length as the first on production runs. A change from automatic to manual saw operation can be made by turning the hand valve on the air line. The automatic attachment will operate from a 60-lb compressed air line.

#### Drill-Driver

**D**EVELOPMENT of the Liberty ratchet drill-driver has been announced by the *Techtmann Industries*, 714 W. Wisconsin Ave.,

Milwaukee 1. Designed for drilling between studs and joists or restricted spaces in buildings or other structures, this tool is said to give



positive feed at each turn of the drill bit. The compact head allows centering of holes within 1 1/4 in. of the nearest obstruction. Any standard wood bit can be used and steel drills can be used with an adapter chuck.

#### Expanding Mandrel

**E**QUIPPED with eccentric sleeve which can hold total tolerance of eccentric parts to be ground or machined to 0.0005 in. or less, a new type precision expanding mandrel has been announced by *Erickson Tools*, Div. of *Erickson Steel Co.*, 2309 Hamilton Ave., Cleveland. With this mandrel eccentric parts can be turned or finished in a concentric plane with the same tools and equipment as for concentric parts, such as bushings or bearings. The tool incorporates self-releasing features, which eliminate the use of arbor presses or other methods to release work. Since the sleeve expands up to the required ID of the part, the danger that highly finished internal surfaces can be injured is eliminated due to the absence of need for forcing a work piece on to the sleeve. Like all type Erickson mandrels, this one can be adapted to air or hydraulic operation and to draw bar, or cantilever locknut types.

#### Collet Air Chuck

**A**NNOUNCEMENT of a new size collet air chuck, known as the No. 10, has been made by the *Redmer Air Devices Corp.*, 601 W. Washington Blvd., Chicago 6. This chuck uses the No. 10 collets, the same as used on Brown & Sharpe high-speed automatics. By use of an adapter sleeve and nose cap the No. 10 can use the regular No. 00 collets. This makes available a small compact collet air chuck with increased capacity; No. 10 collets have a size range from 1/16 to 1/2 in.

#### Cutter Guard

**D**ESIGNED for protecting the operator from chips and cutter, a cutter guard for milling machines has been produced by the *Roll Away Skate Co.*, 4533 Payne Ave., Cleveland. This device, made of heat-treated aluminum, is said to shorten the amount of travel to a very close clearance, thus speeding up production. The coolant is introduced through the guard directly onto the cutter, eliminating splash entirely. Sizes for all milling machines are available.

#### Collet Holding Fixture

**T**WO collet holding fixtures with stationary spindles for production work where indexing is not required, have been introduced by *Hardinge Brothers, Inc.*, Elmira,



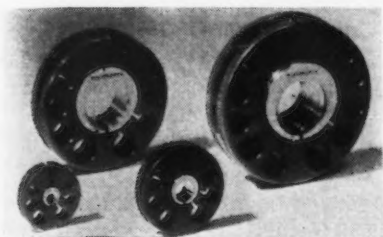
N. Y. In addition to compact design, the bases are machined for use in either the horizontal or vertical position, making them adaptable to special drilling, milling, grinding or broaching setups. The fixture, illustrated, has the addition of a threaded nose spindle, which provides interchangeability of nose accessories. Collets are operated by a lever collet closer with 100 to 1 leverage, with collet capacity to 6 in. diam provided. The overall height of the fixture in the vertical position is 6 1/8 in.

#### Thread Gages

**A**TWIN line of reversible thread gages has been completed by the *Size Control Co.*, Div. of *American Machine & Gage Co.*, 4660 W. Fulton St., Chicago. The new gage is threaded along its entire length and can be reversed when worn in the handle. In addition, worn leading edges can be cut off several times thus multiplying the life of the gage. For easier identification by the inspector, green GO and red NO-GO gripping nuts are at either end of the handle.

### Thread Ring Gage

**A**N adjustable thread ring gage, which is said to assure and maintain roundness through the maximum range of adjustment because of its design which distributes wear over 360°, or the full thread, has been announced by the N. A. Woodworth Co., 1300 E. Nine Mile Rd., Detroit 20. Increased wear life of from 2½ to 5 times over the conventional type ring



gage is claimed. The gage is adjusted along the helix angle of the thread. The gage features an aluminum alloy outer body which gives 50 pct weight reduction in comparison with previous models, and light signals are employed for positive identification. Overall dimensions conform with conventional thread ring sizes.

### Surface Comparator

**A** QUICK scanning surface comparator, developed by the Comtor Co., Waltham, Mass., is said to provide a new means of inspecting the smoothness of finished surfaces. It consists of a photo-electric scanning head, a self-contained amplifier with calibrating controls, a finish meter with tolerance markers, and a ball bearing work-holding carriage. The response of the scanning head, although sensitive to the smallest differences in smoothness, is independent of the direction of the finish grain. The finish meter is graduated so that readings represent the smoothness of the part being inspected as a percentage of the smoothness of the standard used for setting the comparator.

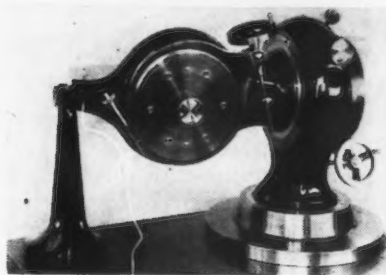
### Vernier Calipers

**F**EATURING a one-piece sliding member with completely open face, a quick action vernier caliper has been announced by the American Measuring Instruments Corp., 240 W. 40th St., New York. Inside diameters are as quickly and directly measured in thousandths, it is claimed. ~~as~~ are outside dimensions.

Depth measurements up to 5 in. are recorded on the same direct-reading scale. Direct thread measurements may be obtained because a beveled edge permits the jaws to get into the thread. These tools are available in both stainless and tool steels.

### Angle Computer

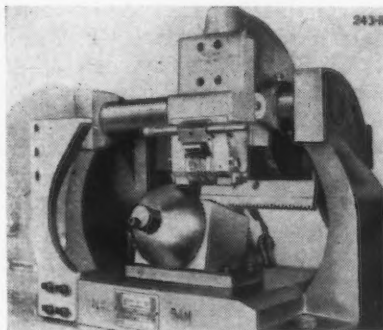
**A**N angle computer, known as the Model G Studler, has been produced by the Angle Computer Co., 1709 Standard Ave., Glendale 1, Calif., for use in the layout of dies, tools, jigs, fixtures, patterns, and castings. The tool may be used also for the inspection of parts, castings, etc. The actuating and locking



mechanisms, together with the three special protractors and verniers are said to assure extreme accuracy.

### Marking Attachment

**C**OMBINING serial numbering with repeat marking, a cup marking attachment for Acromark Series 9A and 9AM marking machines has been announced by the Acromark Co., 341 Morrell St., Elizabeth 4, N. J. With this fixture

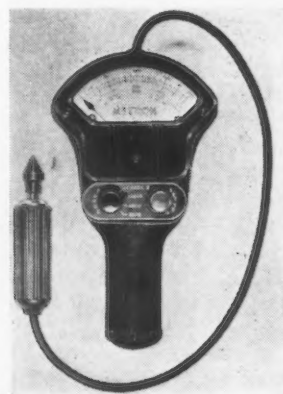


half spherical, spherical and cup shaped steel and other metal and plastic parts can be marked. Consecutive numbering and repeat marking can be accomplished in one operation. This unit consists of a geared mandrel fixture with a form mounted on the mandrel to fit and hold the cup shaped part to be

marked. A numbering machine for automatic advance is mounted in the marking head, and in the frame of the numbering machine mortises for insert dies are placed for repeat marking.

### Hand Tachometer

**D**EVELOPMENT of a portable hand tachometer for measuring rotational and linear speeds,



said to work on a new principle of operation, that of one rotating part permanently lubricated in ball bearings, has been completed by the Metron Instrument Co., 432 Lincoln St., Denver 9. No gears or gear shifts are used, and it is not a generator type. The head consists of a set of contacts operated by the rotating shaft. The instrument has a low driving torque of ¼ oz-in. and is equipped with two disks allowing 6 fpm ranges. It is also available in switchboard types.

### Inspection Lamp

**K**NOWN as the Eder-Lite, a miniature inspection lamp has been designed by Harmon & Co., 6 N. Michigan Ave., Chicago 2, for inspection of hard-to-get-at places, to light up and visually inspect cylinders, gear housings, tubes, rifle barrels, pipes and other equipment with openings as small as 5/16 in. Small light reflecting and glareless metal protected tungsten bulbs attached to a flexible or rigid extension are said to make clear vision possible by steering them down the proper channels so that a maximum amount of light is focused on the proper place. The power is supplied through a rubber insulated wire cable to a transformer enclosed in a Bakelite handle.

### Binocular Magnifier

**C**ALLED the Twin-Reader, a binocular magnifier, manufactured by *N. L. Huebsch*, 81 Yale St., East Williston, N. Y., has dual lenses, scientifically matched and balanced, of finest optical glass, which are claimed to afford third dimensional vision with true perception of depth, and triple the field of observation over the old type one-lens readers or other magnifiers. The Twin-Reader is made in four different powers of magnification and focal lengths. It folds to the size of an average spectacle case, and is furnished with a pocket clip.

### Toggle Pliers

**T**O hold work for welding, drilling, riveting and subassembly where space for such operations is limited, and where parts being held are small, a line of toggle pliers has been offered by *Knu-Vise, Inc.*, 2213



Eighth St., Detroit 16. A normal 40-lb pressure of the hand applied on the handles is said to multiply to a pressure of 400 lb at the work contact, a ratio of 10:1. The pressure spindle has a screwdriver slot to facilitate adjustment and the handles come together to a definite locking stop when work is being held. All models are steel forgings, cadmium plated, measuring 4¾ in. long x 1¾ in. high.

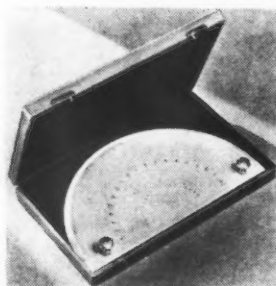
### Slide Rule

**A** DECIMAL point slide rule offered by *Pickett & Eckel*, 53 M. Jackson Blvd., Chicago 4, is said to determine the precise location of the decimal point in involved expressions with results up to 19 places. Deci. Point's simplified arrangement of scales so facilitates computation that beginners as well as advanced slide rule users can evaluate and point off problems, it is claimed. The rule is being manufactured of light-weight Dowmetal and surfaced with a flat white plastic, affording accurate and legible scales and said to be impervious to water or chemicals and virtually

immune to abrasion from regular use. The rule is 12½ in. long and 2 in. wide. A manual provided with each rule covers all phases of slide rule operation and decimal point location.

### Protractor

**D**IVIDED into increments of 10 min, the universal layout protractor has been developed by *Engineers Specialty Div.* of the *Universal Engraving & Colorplate Co., Inc.*, 980 Ellicott St., Buffalo 8,



especially for those whose requirements demand accurate layouts for use on their optical projectors and form grinders. The ruling is on the under side of the beveled plate glass of which it is composed, assuring accuracy of measurement, it is said, as the ruled lines of the protractor are in actual contact with the layout being produced or checked. Divisions are viewed through the thin outer edge, thus contributing to the ease of accurately marking measurements.

### High Frequency Probe

**F**OR measuring voltages in high frequency circuits, a high frequency probe has been offered by the *Alfred W. Barber Laboratories*, 34-14 Francis Lewis Blvd., Flushing, N. Y. This instrument, designed with an input capacity of ½ to 1 mmf, extends the range of measurements of the standard probe ten times, from 50 to 500 megacycles. This model 29, replacing the standard probe of the



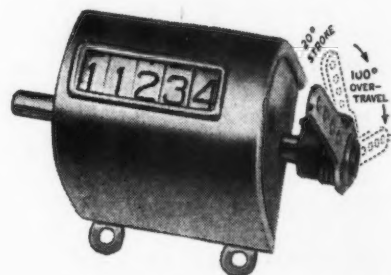
model VM-27 vacuum tube voltmeter, is adjusted to 1/10 the sensitivity of the standard probe. No multiplier is required to measure voltages up to 1000 v. Frequency range is 0.5 to 500 megacycles.

### Inch Converter

**F**RACTIONS of an inch are converted into decimals or millimeters, and corresponding U. S. standard gage numbers and drill numbers revealed by the Calcuaid inch converter produced by *American Hydromath Co.*, 145 West 57th St., New York. This pocket-size converter is only 5¾-in. in diam, yet decimal equivalents are graduated in 0.001 in. and can be estimated, it is said, to an accuracy better than 1/5000 of the range. Metric equivalents are graduated in 0.1 mm and can be estimated to 0.01 mm; the range is from 0 to 100 mm. Gage sizes from No. 3 through No. 30 are provided; drill numbers from No. 1 through No. 60. The company has also produced a pocket-size circular commerce slide rule. Accuracy is enhanced it is claimed by locating most-used scales close to the edge, so that each is actually 12½ in. long. Easy reading is assured by use of contrasting colors on scales. Seldom-used scales found on many slide rules have been eliminated. Both calculator and converter are made of nonwarping noninflammable plastic, said to be unaffected by moisture or ink.

### Stroke Counter

**A** SMALL, rugged non-reset stroke counter with built-in protection against overtravel of the



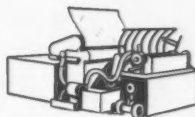
operating arm has been announced by the *Production Instrument Co.*, 708-16 W. Jackson Blvd., Chicago 6. The operating arm works against a coil spring which permits the arm to continue beyond the full stroke without injury to the counter. The arm may be installed on either side of the counter and set at any angle. The counter is completely enclosed in a tamper-proof case. The five large number wheels register to 99,999 and repeat.

# WHEN

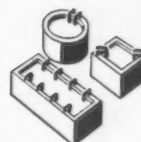
**YOU'RE FIGURING FUEL-COST-PER-TON  
— FINISHED AND SHIPPED**



**YOU CAN'T AFFORD DOWN-TIME  
FOR POT REPAIR**



**YOU WANT THE WORK AND THE PROCESS  
(NOT THE FIRING) TO FIX POT SHAPE**



# THEN

**the logic of KEMP tin  
and lead melting shows up**

**F**UEL costs, for melting, as in dip tinning or lead patenting, are no small factor in the ultimate cost-per-ton of product. Therefore, the opportunity to cut them 30 to 40% by more efficient firing is something to think about.

It's not at all unusual for a switch to KEMP immersion-firing to save that much—because the heat (all of it) is liberated right in the molten metal, not outside the pot. And none is lost to the setting except by flow through the work.

By the same token, pot wall temperatures are lower (from

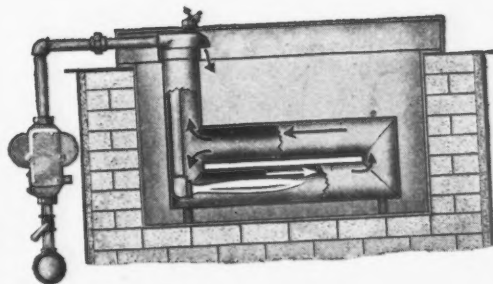
the molten metal temperature *down*)—and more uniform! That's why you enjoy longer pot life with less down-time for maintenance and repair.

And KEMP immersion-firing loops can be of any shape you wish. They can be located in the bath where most convenient to your work and your process. You have full freedom in specifying the setting style you want.

There are 29 years of experience in carbureted-combustion and immersion-melting behind the coupon in the corner. Use it.

## WITH MODERN IMMERSION-FIRING YOU HEAT THE METAL—NOT THE POT

Combustion is within tubular loops totally immersed in the metal. Recirculation of hot combustion gases around each loop (driven by the force of the burner flame) promotes efficiency and uniformity of temperature over the loop surface. When the hot gases do exhaust, they vent down over the molten metal surface, reducing heat losses from the system, and minimizing dross. Standard designs have metal capacities from 2 to 20 tons—special sizes and shapes, and larger capacities, quoted on request.



# KEMP OF BALTIMORE

**PRECISION CARBURETION + ADAPTED COMBUSTION  
FOR INDUSTRY'S HEAT-USING PROCESSES  
ATMOSPHERE GENERATION & ADSORPTIVE DRYER SYSTEMS  
FOR PROCESS CONTROL AND PROTECTION**

The C. M. Kemp Mfg. Co.  
204 E. Oliver Street, Baltimore 2, Md.

JMLco K-H. in

Have a field-engineer come look at our soft-metal melting setup. We want to save 30 to 40% in fuel cost. ☐

NAME

TITLE

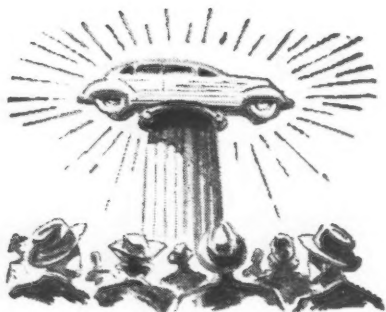
COMPANY

PLACE

# Assembly Line . . .

WALTER G. PATTON

• Motor car producers develop interesting but costly expedients to ease shortages . . . Pig iron is critical . . . Production schedules cut 11 times.



**D**ETROIT—The story of automobile production during the first 6 months of 1946 is anything but "business as usual."

Wooden bumpers shipped with some of the cars will cost producers as much as \$20 per car.

Copper had to be shipped in from Chile when strikes cut off American sources of supply.

In order to keep going one manufacturer paid \$15 per ton premium and brought pig iron to Detroit from as far away as Utah.

With copper wiring in short supply, electric wiring supplies are shrinking.

Zinc is needed for die casting and steel is needed for hundreds of parts.

Yet somehow the industry keeps going, improvising as it goes and hoping that conditions will soon permit production at somewhere near anticipated levels.

With regular sources cut off, it has been necessary in some instances to retool so that needed products can be obtained, often from new sources.

In the case of bumpers, three months were spent to make dies to form bumpers and a new source of supply had to be established to overcome a shortage. One car producer spent several thousand dollars in tooling up for brackets needed to secure the temporary

wooden bumpers to the car frame. When wood became unavailable, another car maker bought war surplus armor plate and processed the steel so it could be used as bumpers.

**C**OPPER for American rolling mills is normally supplied by U. S. producers but during the recent strike, copper was brought in from Chile at the instigation of the automobile industry. An ironical twist to this arrangement is that at precisely the same time the American mines reopened, the Chilean mines went out on strike.

The need for cushion springs has become so desperate that one major producer of automobiles is now making steel rods, a product never before produced in the plant. The rods are being drawn by an outside supplier and then turned over to cushion spring producers. This round-about process is being continued even though the spring shortage has eased noticeably in the past several weeks.

Another car producer has resorted to the drawing of alloy wire to make up for a deficiency in materials needed for cushion springs. Costs were naturally increased by this move but the production of finished cushions went forward.

**T**HE critical situation with respect to pig iron was recently brought out in a letter by George T. Christopher, president of Packard Motor Car Co. to Roy O. Woodruff, Michigan representative. Pointing out that the Packard foundry was operating at only 25 pct of the desired rate of production and that the company is employing less than half the number of workers it should have on its payrolls, Christopher charged that this condition existed because of shortages of material "mostly created by Government attempts to regulate the economy of the country."

The letter disclosed that Packard requires 200 tons of pig iron to permit operations at 25 pct of capacity. At the time, receipts were 50 tons of pig iron per week. With its stock pile exhausted, the com-

pany was confronted with the choice of running at 6 pct of capacity or not running at all.

Mr. Christopher pointed out that all of the capacity of the Woodward Co., Woodward Ala., one of Packard's principal suppliers, was being diverted to the Housing Program. Another source, Republic Steel Co., was shut down for lack of coal. A Geneva, Utah, source was reported to be allocating its output to the West Coast.

Packard now has a sufficient supply of pig iron to maintain operations but the possible ill effects of the new government program to channel critical merchant pig and malleable and gray iron castings into farm machinery and residential building products are being watched nervously.

Many other interesting although costly practices have been adopted by the motor car industry to relieve present shortages.

With cotton fabric in limited supply, one manufacturer has turned to artificial leather for its upholstery—a much more expensive product. The leather is being used for door panels and interior trim.

Nuts and bolts are being treated with zinc instead of cadmium. Zinc is more expensive to use than the cadmium treatment in preventing corrosion and a heavy coating is said to be required to meet the salt spray tests called for by specifications.

Another expensive innovation by the automotive industry has originated because of the critical shortage of natural rubber for weather stripping. The synthetic material which is replacing the natural product has poor adhesive properties and only the most expensive rubber glues can now be used to seal the job.

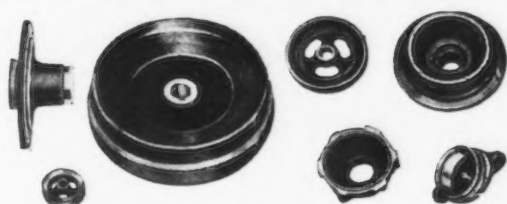
Air freight service was recently established from a plant in small Leroy, N. Y., to maintain a supply of front wheel spindles.

Because corn starch is short, foundries are finding great difficulty making the foundry cores that are employed by the thousands in making automotive castings. A scramble to find a satisfactory substitute is now taking place.

Bullard Mult-Au-Matics over a period of years have been tooled for thousands of different types of work, some of which are shown in the illustrations. Many installations previously on peacetime products were quickly converted at low cost to meet the requirements of wartime production.

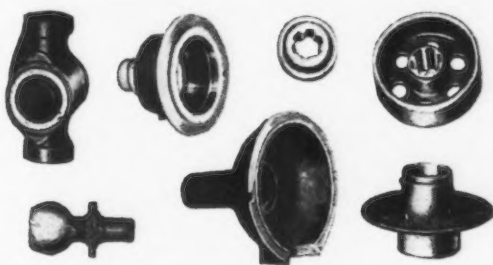


Looking now towards reconversion to peacetime needs, prewar or wartime machines will require retooling, and Bullard engineers stand ready to figure your costs for maximum production and efficiency on your postwar jobs. Well-balanced operations and tooling effect a higher degree of



Mult-Au-Matic efficiency. Bullard engineers are well versed in this technique and their services are your logical choice.

Send blueprints or samples for Bullard engineering time and cost estimates on tooling reconversion. Prepare now and be ready for postwar competition. The Bullard Company, Bridgeport 2, Connecticut.



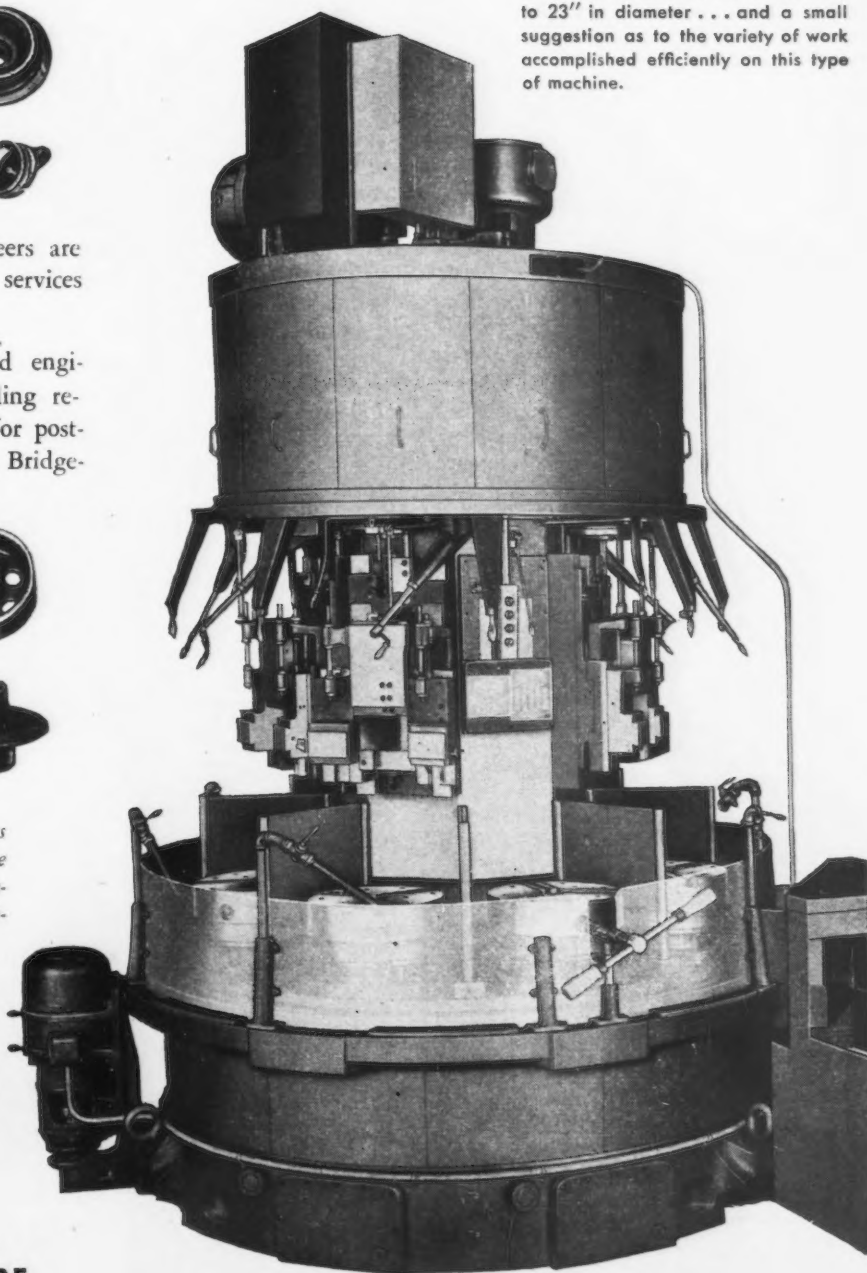
*From Government Machine Tool Surplus Lists select the better machines to replace obsolete models you've been using on non-critical operations. Ask Bullard by serial number for information on your selections.*



**CREATES NEW METHODS  
TO MAKE MACHINES DO MORE**

**HOW A  
BULLARD MULT-AU-MATIC  
FITS  
POSTWAR PLANNING**

Bullard Type "D" Mult-Au-Matics with 6 or 8 spindles in 4 sizes for work up to 23" in diameter . . . and a small suggestion as to the variety of work accomplished efficiently on this type of machine.



THE net effect of strikes and materials shortages can be appreciated by calling attention to some of the conditions that are currently limiting automobile production:

One automotive producer is short 20,000 bumpers. Steel rims for wheels are slow in coming through because a major supplier is strike-bound. Front fender deliveries have been hit by the steel shortage. With copper wiring in tight supply, electric wiring supplies are shrinking. Copper is also badly needed for radiators, zinc is short for die castings and the steel requirements for many parts are not being met.

One result of the present situation is that suppliers who have been able to make deliveries up to now may have to wait for a considerable period of time to make new sales. A major producer, for example, has been forced to cut long term production 11 times since VJ-Day. Vendors who have made deliveries on time find their quotas have been filled and they must now wait until other suppliers catch up or production schedules are revised upward.

Thus confusion is added to confusion in an industry that must plan and synchronize every detail of its operations weeks ahead of actual production in order to produce

in large quantities and at satisfactory levels.

To get away from strikes and shortages, an interesting development in passenger car production programs is the current interest in station wagons. While the station wagon has never been a sizable part of total passenger car output, the trend has been definitely upward since 1937 and this year each of the automobile manufacturers seems to be trying to outdo the other in an effort to produce the most attractive model.

At the present time station wagons constitute hardly more than 1 pct of all passenger cars produced but these models are receiving much more than 1 pct of the interest of automobile salesmen and their customers.

THERE are several reasons for current interest in station wagons. Many industrial concerns use them as courtesy cars; airlines employ them to bring passengers to and from airports and many schools use them to transport small groups of children where the use of an ordinary car or bus would not be feasible. Owners of ranch-type farms, and "gentlemen farmers" have long shown a decided preference for the station wagon. The cumulative effect of these diversified interests has been

to lift the station wagon into the spotlight, temporarily at least, in the passenger car market.

Of particular interest to the steel industry is the fact that there is a strong inclination to go from wood to steel construction of station wagons. One company is using a metal body with a stain simulating wood grain. Another manufacturer is reported to be planning to cover a steel base with a thin veneer of wood bonded to the metal with a thermal-setting adhesive. This type of construction is said to be lighter and at the same time stronger and safer; it is also reported to be less costly to build.

### Increased Prices For British Automobiles Have Been Announced

London

• • • Increased prices for British manufactured motorcars, on account of higher wages and dearer materials, have been announced by Morris Motors, Ltd., Wolseley Motors, Ltd., Jaguar Cars, Ltd., and Riley (Coventry), Ltd. The following prices have now come into force:

Wolseley

- 8-hp saloon, \$1440 (purchase tax, \$403)
- 10-hp saloon, \$1600 (\$469.66)
- 12/48-hp saloon, \$1960 (\$547.43)
- 14/60-hp saloon, \$2140 (\$597.43)
- 18/85-hp saloon, \$2950 (\$658.54)

Morris

- 8-hp two-door fixed head, \$1080 (\$303)
- 8-hp two-door sliding head, \$1120 (\$314.11)
- 8-hp four-door fixed head, \$1160 (\$353.21)
- 8-hp four-door sliding head, \$1200 (\$336.33)
- 10-hp fixed head (four-door), \$1350 (\$378.00)
- 10-hp sliding head (four-door), \$1390 (\$389.08)

Jaguar

- 1½-liter, \$2460 (\$686.33)
- 1½-liter special, \$2620 (\$730.76)
- 2½-liter, \$3100 (\$864.11)
- 3½-liter, \$3440 (\$958.54)

Riley

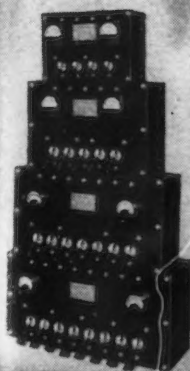
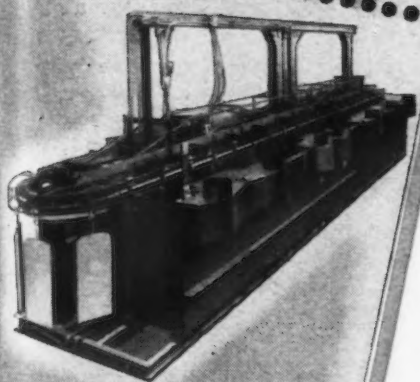
- 1½-liter, \$2700 (\$753)

M.G. Midget

- \$1650 (\$461.30)

THE WINNER: After a war-time lapse of several years the traditional Grand Concours D'Elegance has been revived in Belgium. The newest models of both European and American car producers are on display. In this "motor car beauty contest" Madam Evy Burclay of Brussels and a 1946 Packard DeLuxe Clipper Eight were declared winners.





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In normal times Udylite can and has furnished you whatever you needed in jig time. Right now it is anything but easy to get a number of products as you well know.

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# Washington . . . ■ ■ ■ L. W. MOFFETT

• Drive against big business timed to Congressional elections . . . WAA lauded and then criticized for surplus disposal to small business.



**W**ASHINGTON—Like the tail of the snake which refuses to stop wriggling even though “divested” of its head, vestiges of the New Deal cling desperately to life and periodically renew their attempts to regain the spotlight. Hence, with elections approaching at a rate far too fast to please some, it comes as no surprise that these influences are causing agencies, bureaus and committees to again break out in a rash of investigations.

The House Small Business Committee, like its counterpart in the Senate, perpetuates itself chiefly by instituting investigations directed at “big business,” whatever that is. Off to a late start, just now the House Committee is starting an investigation concerning the “seriousness of the monopoly and concentration problem.” The Senate Committee has been making a similar “study.” So did the SWPC. Since inheriting SWPC files and records, Henry Wallace, Secretary of Commerce, no respecter of the other fellow’s bailiwick, issues almost daily tirades against the growth of “big business,” little concerned whether his horning in on the Dept. of Justice is or is not palatable to the latter.

Meanwhile, Justice is stirring up

new cases against “big business.” Duplication of effort, its cost to the taxpayer, endless “surveys,” mean nothing to the biggest and most expensive business of all—the federal government. In more need to be whittled down than the industries that come under its attack, the government declines to yield for application to itself of any of the Attorney General’s famous triple D’s—divorcement, dissolution and divestiture.

Caught between the fire of the bureaus is the harassed and beaten War Assets Administration. Periodically, the Administrator, flanked by a half dozen or more assistants, is pulled away from his job of getting rid of surpluses before the seller’s market becomes once more a buyer’s market. Supported by records and ledgers, they reassure their inquisitors that everything is being done to assure the veteran and small businessman a fair share of the war spoils.

**F**OLLOWING the latest appearance of WAA before the Senate Small Business Committee in June, Chairman Tom Stewart (Tenn.) indignantly asserted that his committee was not “witch-hunting” during the 4-day hearing which also included testimony by representatives of veterans’ organizations and individual businessmen.

“We are not . . . seeking out scandal-sale disclosures,” Senator Stewart averred. “This is an honest effort to review conditions, make constructive suggestions and, if necessary, introduce corrective legislation.”

In a preliminary report, the committee assumed the unusual position of praising WAA with one hand and chastising it with the other.

“Evidence was submitted that WAA is getting on the beam for more equitable and more rapid disposal of surplus property . . . with full consideration for the new veteran priorities,” the report stated. Then it added sternly:

“At the same time, it was equally evident that small business as such stands in danger of getting lost in the shuffle among the agen-

cies responsible for its surplus property prerogatives.”

On the face of it, it would appear that WAA is leaning over backward to please and satisfy all factions, including “small business.” A deputy administrator, Gen. Gordon Textor, explains that among the steps taken to give “small business” a break WAA has extended time limits on such sales from 5 to 10 days and has arranged to have a bonded RFC representative at each site sale to handle small business transactions.

In addition, since the June hearing the WAA has issued Reg. 21 which provides a more equitable pricing and distribution method and at the same time limits advantages held by the possessing contractors. A few days later, the disposal agency revised Reg. 10 in such a way as to grant RFC an acquisition priority second only to federal agencies when it is acquiring property for resale to small business.

As a matter of fact, the real trouble would appear to be that surplus disposal has been kicked around from agency to agency and the regulations rewritten and revised to such an extent that the average business man, big or little, has little idea of where he stands.

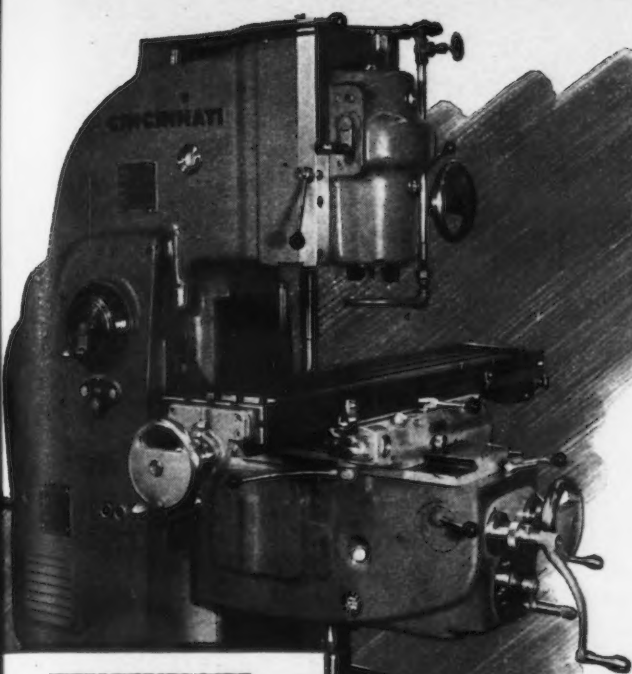
Originally the stewardship of matters pertaining to the so-called “small business” was lodged with SWPC which was organized to spread war contracts among small plants not only to prevent hardship but primarily to expedite production. When this agency was liquidated last December, RFC took over the financial end of the business while Commerce received the advisory and service powers. In the meantime, WAA was created to handle all disposals.

**A**LTHOUGH there are 76 RFC loan offices with legal authority to take applications from small firms for purchase of surplus property, there is no indication that these offices received instructions to this effect until late March. And just about that time, certifications under Sec. 18 (e)—small business—were halted while the procedures

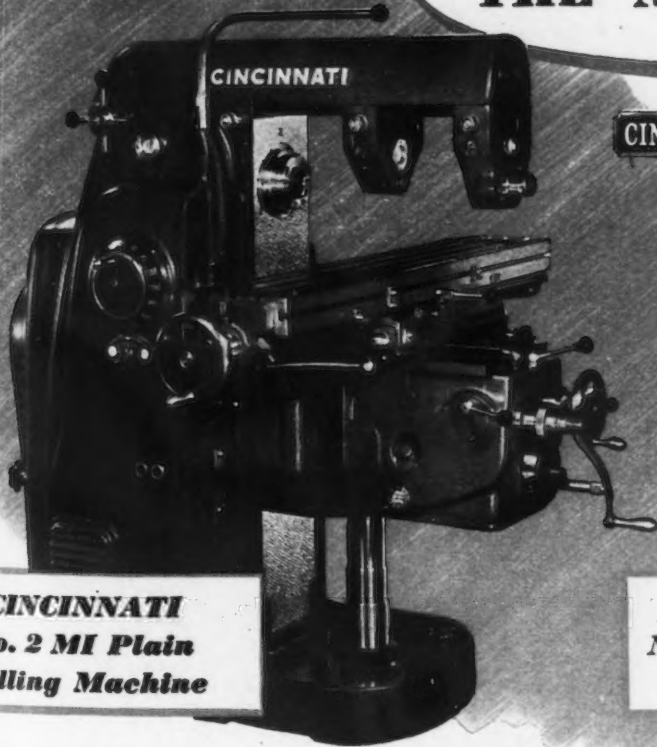
# A NEW Milling Machine

BY CINCINNATI

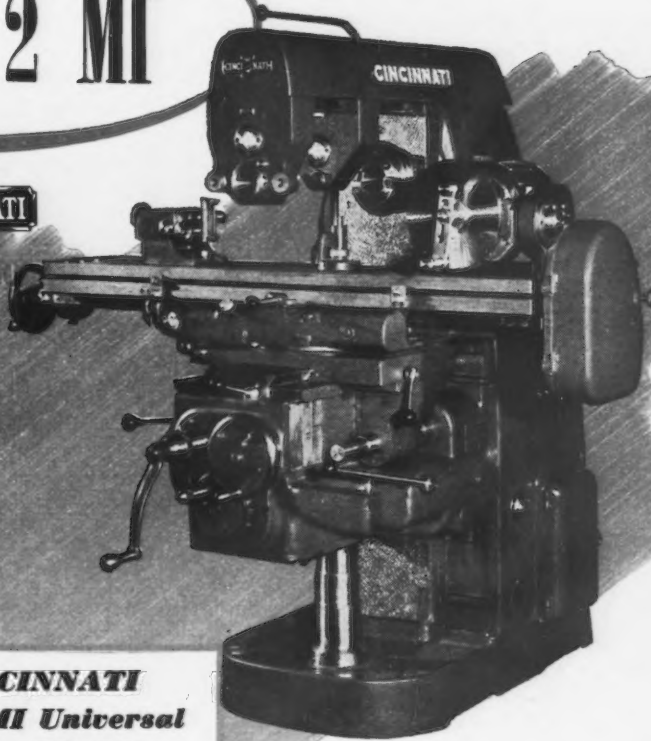
THE NO. 2 MI



**CINCINNATI**  
**No. 2 MI Vertical**  
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The development and building of machines that will handle machining operations to better advantage has always been the paramount aim of Cincinnati Milling. And while this end result is necessary to offset rising costs, the machine tool itself must have more than features of rapid output; it must also gain operator acceptance. The new CINCINNATI No. 2 MI Milling Machines fulfill both of these requirements. They offer

many new features for today's production, and they have features of safety and dependability which quickly win operator acceptance. If you would keep abreast of the accelerating business tempo, investigate the possibilities offered by the new CINCINNATI No. 2 MI. These new machines are available in Plain, Universal and Vertical styles. Complete engineering specifications may be obtained by writing for catalog M-1429-1.

**THE CINCINNATI MILLING MACHINE CO.**

CINCINNATI 9, OHIO, U. S. A.

for the newly ordered veterans' priorities were worked out. To top it off, there is little indication that any special effort has been made to advise operators or owners of small firms that they have special purchasing rights in the matter of surpluses.

These rights are set forth in Sec. 18 (e & f) of the Surplus Property Act and were originally the responsibility of the SWPC. With its disbanding, they became the charge of RFC. More specifically they (e) authorize the agency (RFC) to purchase surplus property for resale to small firms, taking in exchange "other" property as partial or full payment and (f) to make or guarantee loans to small enterprises, particularly in regards to acquisition or conversion of small war plants.

Those who are aware of their rights or preferential status in this direction have been hopefully awaiting assistance through the RFC's Small Business Div. which it set up for this purpose late in May. However, "procedures," an important word in government administration, have not been definitely established. Even the new division's director, Chauncey Y.

Dodds, is understandably vague on these matters, largely because overlapping functions and procedures of RFC and WAA in this direction have never been cleared up.

It is now more evident than ever that the greatest obstacle to rapid liquidation of surpluses is directly traceable to the provisions of the Surplus Property Act and its subsequent amendments which establish preferences for a full half-dozen groups of priority claimants. Praiseworthy as this may be for the purpose of assuring equitable distribution, there is no avoidance of the simple fact that it results in bringing out literally hundreds of thousands of individual claimants, each of whom, under the law, must be considered, thereby adding to the already tremendous administrative burden.

Getting back to investigations, these will continue to mature and flower; it would not be surprising at any time to learn that an investigation of an investigation had been inaugurated. Meanwhile, the House Committee finally has conceded that "big business" is not responsible for at least one thing—the shortage of baling wire. The committee even says that price is

not the cause. After "investigating" complaints from farmers and distributors, the committee makes the report, startling in view of its source, that the shortage is "general over the country and not localized in a few places because of maldistribution."

\* \* \*

**C**ARRYING out its announced policy of replacing obsolete items of equipment to a limited extent by newly developed items which are markedly superior to those now in use, the Army expects to purchase during the fiscal year 1947 approximately 1046 of the most modern aircraft of all types from very heavy bombers and jet fighters to liaison planes and 26 metal gliders.

Actually, the Army hopes to spend slightly in excess of \$400 million for "markedly superior" items. All but about \$20 million of this amount will go to the Army Air Forces. This latter amount will be used for ordnance items, including mortars, rocket launchers, rubber tank tracks, and a new utility vehicle. The Corps of Engineers will also use a small portion of it for field service tests on new items.

\* \* \*

## THE BULL OF THE WOODS

BY J. R. WILLIAMS



Only a little more than 1000 war contracts still remain unsettled, as compared with the Army's backlog on Aug. 31, 1945, of 65,288 unsettled cases. Those remaining have a cancelled commitment value of about \$1.5 billion and represent the largest and most complex termination problems. The job will be virtually completed by the end of August. A few difficult cases will require to Jan. 1 to dispose of.

\* \* \*

The Army will spend some \$48 million during the current fiscal year for the care and handling of surplus property in the United States which has not been taken over by the War Assets Administration. Brass-hats are irritated over WAA failure to take possession and dispose of large quantities of property that had been declared surplus months ago. Army declarations, exclusive of flyable aircraft, have amounted to more than \$5.6 billion. But only about \$2.5 billion worth has actually been taken off the Army's hands.

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### READ THESE ACTUAL "CASE HISTORIES" FOR AN AMAZING STORY OF IMPROVED PRODUCTION AND QUALITY

Carboloy Cemented Carbide Sheet Metal Dies are gaining increased usage in a wide range of applications involving Blanking, Cupping, and Drawing Operations because experience proves they bring such desirable advantages as: unusually long die life, closer tolerances on drawn parts, more continuous press operation, fewer "rejects", lower cost per piece, vastly improved surface finish (almost mirror-smooth, thus cutting down buffing time), and a substantial increase in output per press.

For more complete information on how Carboloy Cemented Carbide Sheet Metal Dies can help you, write for Booklet D-120.

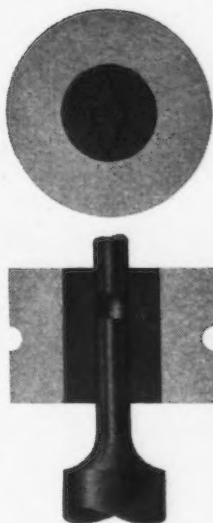
### DOWN-TIME & SCRAP REDUCED 50% ... PRODUCTION BOOSTED 25-30%

In deep draw and cupping operations on 2 in. and 7 in. diameter SAE 4130 chrome "moly" steel cylinders (and other alloy steel, mild steel, stainless steel and aluminum cylinders), the 20,000-piece average on steel dies was upped to 250,000 average with Carboloy Dies. Only .003" die wear after 500,000 feet. Down-time and scrap reduced 50%—production increased 25-30%.



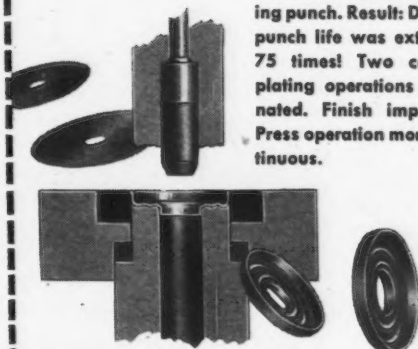
### HIGH WEAR RESISTANCE LEADS TO PRODUCTION INCREASE OF 142 TIMES

On high-abrasive ceramic materials, one manufacturer stepped up production from 700 pieces to 100,000 by using Carboloy mould inserts. Extraordinary wear-resistance of Carboloy made this possible.

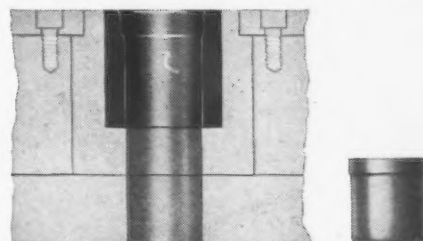


### DIE LIFE MULTIPLIED 75 TIMES

On tough beryllium copper parts, steel dies wear rapidly. Carboloy Dies replaced tool steel at two critical points, the draw ring and extruding punch. Result: Die and punch life was extended 75 times! Two copper-plating operations eliminated. Finish improved. Press operation more continuous.



### HIGH PRODUCTION AVERAGE HELD



Steel dies produced 60,000 refrigerator muffler shells (drawn from steel .030 inch thick). Replacing with Carboloy deep-drawing Dies raised production to 700,000. Continuous high production average was held despite close tolerances.

### 8,000,000 PIECES WITHOUT REWORKING DIES

The job: Punching, drawing, trimming .0095 in. thick stainless steel (30% chrome) radio tube base parts, 87 Rockwell B, tolerance of plus-or-minus .003 in. Ordinary dies required dressing after every 50,000 to 60,000 pieces. With Carboloy Dies, this manufacturer turned out 8,000,000 pieces, using only one set of dies, and without reworking dies for the entire quantity!

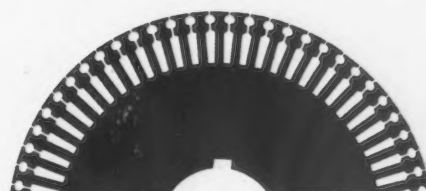


### HOW TO LICK TOUGH PUNCH AND DIE SET PROBLEMS

Carboloy Cemented Carbides enable you to increase production per individual die in your lamination dies. On one application, the best steel punch and die punches 150,000 slots, against up to 5,000,000 slots with Carboloy Die Inserts and Solid Punch.



### CLEANER JOB, FEWER SET-UPS



Carboloy Dies and Punches for blanking out motor laminations give 10 times the life of comparable steel dies and punches, and greatly reduce the number of punch and die set-ups. Cleaner blanking jobs, in less time, with fewer set-ups required per job.

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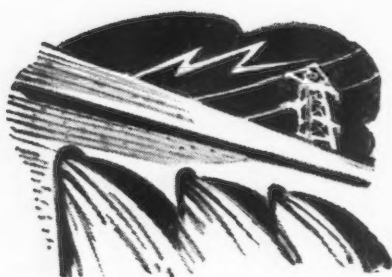
**CARBOLOY**

TRADEMARK

SHEET METAL DRAWING  
and BLANKING  
DIES

# West Coast . . . ■ ROBERT T. REINHARDT

• Light weight passenger bus-trailer combination utilizes magnesium and aluminum and practically eliminates steel . . . Mexican bus order encourages Los Angeles fabricators . . . Oil possibilities lure strange bidders for tube plant.



**P**ERMANENTE, Calif. — Apricot pickers, motorists and traffic cops had occasion to blink their eyes and pinch themselves one day last week as Henry J. Kaiser's answer to mass transportation sped along the highways and byways of this lush Santa Clara Valley on its maiden trip.

The year long secrecy which has surrounded the building of this magnesium aluminum steel passenger bus and trailer unit was lifted at a full-dress press preview worthy of the launching of a super dreadnaught. Perhaps this analogy is appropriate since the 60-ft long combination can best be described as a land going cruiser.

Built at a cost of approximately \$150,000 in the shops of the Permanente Metals Corp., this prototype may be the forerunner of large fleets if test runs to be conducted by Santa Fe Trail Transportation Co. prove successful.

Forward, or tractor, unit of the combination is superficially similar to a standard bus, and the trailer section, attached by a newly developed hitch and with its two wheels geared by a patented method to follow the tracks of the front wheels, is a smaller edition of the forward section.

Total weight of the complete unit is 28,000 lb as compared to the

22,000 lb weight of a standard bus. Seating capacity of the double unit with standard seat spacing is 63 as compared to 37 in a conventional bus. By use of approximately 55 pct magnesium sheets and structurals, approximately 35 pct aluminum and 10 pct steel (practically all in engine and wheels), weight per passenger is reduced from the standard of about 600 lb to about 450 lb.

Fully articulated and with the space from the rear end of the tractor unit to the front of the trailer section enclosed in a flexible, accordion shield, the mammoth combination resembles a streamliner of the rails. Interior of the prototype is finished in a luxury style with only 40 seats widely spaced and with two toilets and lavatories. It is reported that such an arrangement would be recommended for the longer trips. Inside headroom is 6 ft 8 in.; seats are plush covered rubber foam and can be adjusted to swing in a full circle; and walnut and maple finished aluminum sheets form interior walls and ceiling.

Cummins Engine Co. designed a special 6-cylinder, 275 hp supercharged, horizontal diesel motor for the power unit. Located under the floor midway between the front and center wheels, its weight contributes to an unusually low center of gravity. Baggage compartments, spare tires and tools and air conditioning units are also under the floor.

**M**ONOCOQUE construction is used in the coach and a major part of its design is credited to two brothers, V. F. and M. G. Antoine. These two men developed the patented mechanism which steers the rear wheels on the trailer automatically as the front wheels are controlled by the driver.

Riding qualities of the bus—even in the trailer section—are excellent and much of the credit for this characteristic is given by the designers to the torsilastic springing and hydraulic shock absorbers.

According to officials of the Kaiser interests, 14 more buses are on order for the Santa Fe Trail

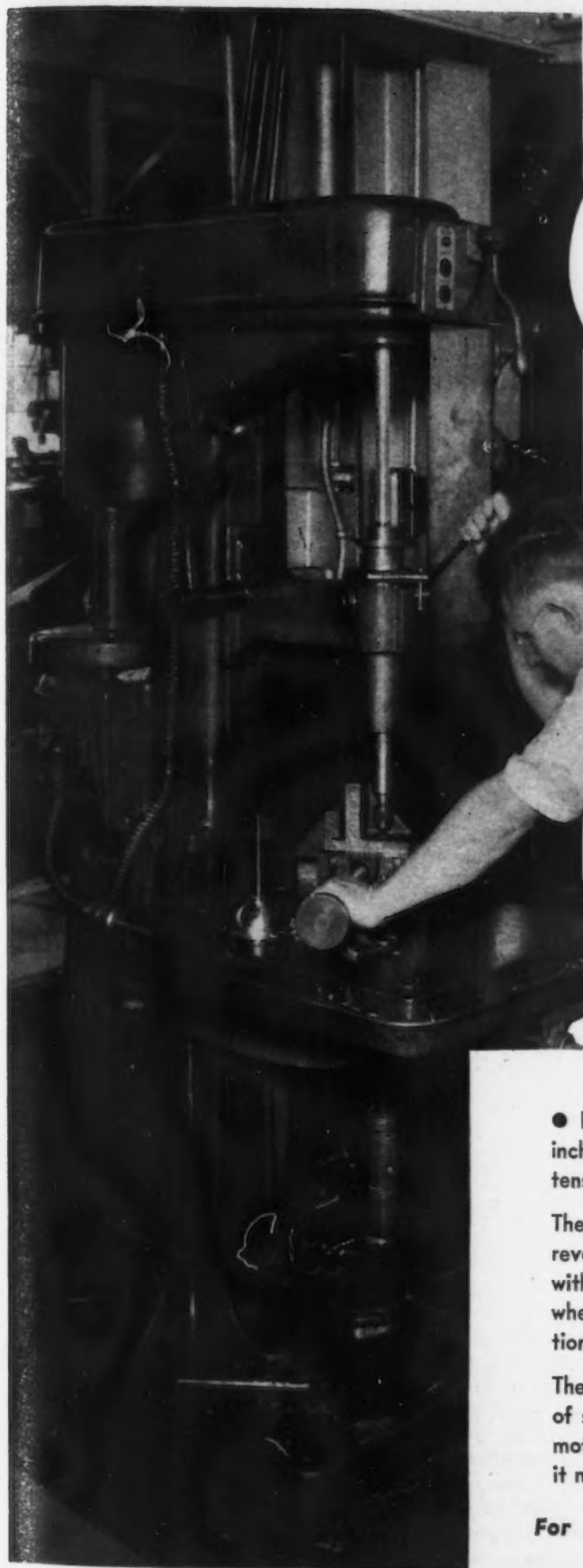
Transportation Co., and will probably be built at one of the Kaiser shipyards in Richmond, Calif. No definite production cost has as yet been determined, but persons familiar with bus construction costs estimate that unless production reaches into thousands of units, the cost should run between \$35,000 and \$45,000.

The magnesium sheets and structurals incorporated in the prototype were produced by Revere Copper & Brass, Inc., at Baltimore, but it is expected that when production on the additional units gets under way Mr. Kaiser will endeavor to finish his own materials—possibly in the Trentwood, Wash., aluminum rolling mills. The aluminum used in this first model was purchased on the open market.

No definite statements were made as to when the Permanente Metals Corp. would resume production of magnesium, but it is understood that considerable progress has been made in reducing operations involved in the carbothermic method of production by half and that the short cut production method is now out of the pilot stage. The new method is reported to eliminate the costly and time consuming recovery of metal from pellets of carbon and magnesium dust in electrically heated retorts. This would mean that ingots could be produced directly from the fine magnesium powder produced in the electric reduction furnaces from magnesia, and that costs would be cut almost 100 pct.

Only one of the three electric furnaces which have been producing ferrosilicon and other alloys here for the Manteca, Calif., ferrosilicon magnesium plant and the steel industry, is now in operation on alloys. However, the other two furnaces are to start operations within a few days in the production of fertilizer from local serpentine rock and phosphate rock brought in from Utah.

Production of basic refractory brick and ramming mix is getting into full swing at the new Moss Landing plant of the Permanente Products Co., with shipments being



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Precision Drilling*  
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*Sensitive Drills*

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The machine shown is equipped with magnetic switch for reversing motor for tapping. When thread is completed, with button in tapping position, you merely move hand wheel back—the motor will then run in the opposite direction backing out the tap.

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made to all parts of the country according to the sales dept.

**L**OS ANGELES—Considered a healthy trend for local manufacturers in the metalworking industry is an order from a Mexican company for 500 all aluminum buses. Despite the huge Mexican industrial potential, there is little fabrication equipment in that country so that excellent opportunities prevail for California fabricators to produce a variety of goods for final assembly in Mexico, according to Robert A. Trumpis, national president, American Society of Industrial Engineers and member of Trumpis-Collar & Associates, in an interview with *THE IRON AGE*. Due to its proximity and harbor and rail facilities, Los Angeles holds a point of advantage, he stated.

Principal demand is for simple heating equipment for the home, using electricity rather than gas, and all types of transportation equipment and household appliances, Mr. Trumpis pointed out. Mexican workers, he stated, were excellent craftsmen and displayed great manual dexterity and he recommended that as a gesture of goodwill, the United States might send a commission to develop the Mexican potential by sound industrial training and guidance. Interest is being displayed by government officials and industrialists in building Mexico's potential and a great demand exists in the country for semiraw materials and components for final assembly in Mexico.

Indicative of this trend is the contract for 500 buses expected to be built by a local concern. The 35-passenger buses, believed to be the first to incorporate aircraft construction, unless the Henry J. Kaiser bus and trailer just announced also comes under this classification, will be all aluminum, skin stress construction, with extrusion ribs and side beams. Plans call for the design and building of eight buses to be mounted on International chassis and given a trial run down the Laredo Highway to Mexico City by the end of September.

The 500 bodies will be shipped in panel sections—two sides, one front, rear, top, and bottom, and seats separately. Final assembly will be accomplished in Mexico City where an assembly plant is expected to be built by October. Shipment

will be either by water to Acapulca and truck to Mexico City, or Southern Pacific railroad to Guadalajara and truck to Mexico City.

\* \* \*

WAA is somewhat in the position of the mother of a homely, but potentially wealthy daughter, who isn't sure if her offspring's suitors are in love with the gal or her potential fortune. Since it was learned that Pacific Tube Co. was located within 1000 ft of the discovery well in a proved oil producing area, bidders for this war born manufacturing plant include at least two companies whose interest in tube production is only slightly more than academic.

Bids in the hands of WAA in Washington include the following: Richfield Oil Corp., \$135,000 for oil rights and mineral rights of the 16.2 acre tract. Shell Oil Co., lease 16.2 acre tract for oil and gas development on condition that it receive a one acre drilling site together with ingress and egress to property, and will pay minimum royalty of 25 pct; in event 50 pct net profit exceeds minimum royalty, will pay as an additional royalty an amount equal to the excess. Pacific Tube Co., \$1,040,200 for entire property, including mineral rights. Midland Steel & Equipment Co., Chicago, \$485,633 for all land, buildings, cranes and improvements except tube making machinery, inventory and oil rights; inventory exclusion refers only to tube making machinery parts and processed tubes. Harvey Machine Co., royalty of 1/5 net annual income and costs, plus \$2000 annual bonus. D. D. Stewart, Lexington, Ky., \$1,350,000 for entire property.

Pacific Tube Co. is still operating the plant which includes facilities for production of drawn tubing and a \$175,000 Yoder steel tube mill. Built in the record time of 67 days to supply the heavy wartime demand for tubes on the Coast, there has been considerable conjecture as to the profitable peacetime operation of the plant. Apparently the discovery of oil nearby assures the government of an ample return of its investment.

**S**AN FRANCISCO—The steel industry contributed 300 tons of plate in thicknesses of from 3/4 to 2 1/4 in. in the construction of the 12-ft dia, all welded, low turbulence

pressure wind tunnel put into operation last week at Moffett Field near San Jose for the Ames Aeronautical Research Laboratory. Designed for the study of supersonic speeds the huge tube must withstand external pressures of 12,600 lb per sq ft. Before being placed in operation the tube was hydrostatically tested at 120 psi with 5 million gal of water. Six thousand gallons were added to take up the stretch of the steel under the test load.

Winds with speeds up to 750 mph can be produced and the tunnel can accommodate plane models with 10-ft wing spreads.

\* \* \*

**Production at the S. San Francisco plant of Bethlehem Pacific Coast Steel Corp.** was seriously curtailed last week for 24 hr when 1000 men walked out because of the formation of a new crew to operate the 18 and 24-in. mills on a split week basis. It was the contention of the CIO United Steelworkers that such an arrangement was a violation of their contract which limited split week work to 15 pct of the total work hours. However, the men who had been promoted to handle the mills and thus make available more semifinished steel on Mondays were content with the arrangement, and it was their protests which ended the unauthorized strike, according to Bethlehem officials.

\* \* \*

**Contract for the 5600 tons of 7/16 to 1 in. steel plate** which Western Pipe & Steel Co. will need to fabricate 9600 ft of 12-ft diam welded pipe for a Grand Coulee Dam pumping unit has not been awarded. This tonnage should be inviting to both the Fontana, Calif. and Geneva, Utah plants.

Bureau of Reclamation requests for bids on reinforcing steel have not met with too much response in the past few months if the frequency of advertising of the same jobs is any indication. Many tonnages have been up as often as five times in the past 5 months. Suppliers indicate that this situation is attributable to uncertainties in the price structure at time of future deliveries as well as to current shortages.



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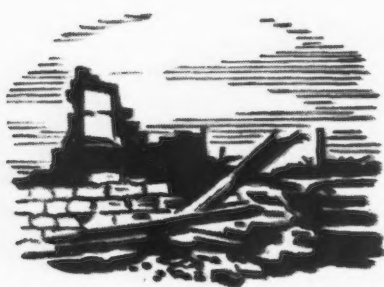
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# European Letter . . . JACK R. HIGHT

• French steel production one-third below demand . . . Steel mills lobbying for possession of continuous strip mills . . . French ore mines concerned over Swedish efforts to replace former German markets.



PARIS—French steel production for the second quarter of 1946 averaged about 30 pct below demand, according to figures released by Mr. Pierre Delaye-Raynal, director of the economic program in the Ministry of National Economy, in outlining the need for continued strict allocation of steel products. With a production rate of 66 pct of prewar capacity France is assured of about 1,122,000 tons of ingots per quarter for allocations.

In an effort to increase the production of steel, a rigid program of coal economy has increased the coking coal allocation for steel from 330,000 tons per month at the end of 1945 to 594,000 tons for August of this year. Hopes are again high on the basis of these allocations that the ingot production rate will go up and new blast furnaces will be lit.

Steel production for the second quarter of 1946, due to coal shortage, amounted to 1,089,000 tons available for allocation made up as follows: 968,000 tons home production, 33,000 tons rerolled products, and 88,000 tons of imports. In the third quarter of 1946 the estimated availability is 1,177,000 tons, composed of: 918,500 tons home production, 209,000 tons rerolled products and castings, and 49,500 tons of imports. The "essential" de-

mand for the third quarter is estimated at about 2,750,000 tons.

The original French plans called for an import of from 220,000 to 275,000 tons of steel products each month during 1946. Actual receipts have averaged nearer 55,000 tons since the beginning of 1946. The recent French-American loan agreement allows a limited number of dollars for the purchase of various products, but basically France is expected to depend upon her own steel production.

French steel tube production is one of the more encouraging pictures at the moment, with May production amounting to 92 pct of the monthly 1938 average (15,420 tons). The monthly average for 1943 was 10,940 tons. With a heavy domestic and European demand for tubes, French steel companies are anxious to raise this production if possible.

The construction of new pipelines in the Middle East will require large tonnages, and although English mills will get most of the business the Iraq Petroleum Co. has placed some business with French mills. The Louvroil, Monbard, Aulnoy Co., one of the largest French tube producers, reports that part of the 22,000 tons of tubes ordered by the Iraq Petroleum Co. to double its existing Middle Eastern pipeline has already been delivered. The Valenciennes & Denain Tube Co. has announced that its board of directors has decided to build a new large tube mill. This company is a subsidiary of the Denain & Anzin steelworks.

THE reconstruction of the Mondeville steelworks near Caen has begun, but it is being restrict-

ed by the shortage of construction material and machinery. One wire mill is back in operation at present. These works were almost completely destroyed by heavy bombardment during the war and with the Creusot works were the only French steelworks severely damaged during the war. The Mondeville works consisted of two blast furnaces, six coke ovens, four 30-ton bessemer converters, five openhearth furnaces of 30-ton capacity, and five finishing mills.

French reports in the weekly industrial newspaper "Nouvelles Economiques" state that American officials have promised France 55,000 tons of steel imports a month for the second half of 1946. According to this journal, steel imports arriving in French ports since the beginning of 1946 have been as follows: January 61,160 tons, February 71,060, March 37,950, April 51,260. These imports were all on orders placed in 1945, and for the present all shipments have been suspended following a wave of strikes.

French sources hope that the recent loan agreement may make transactions with American steel mills a little simpler, but strike a pessimistic tone in analyzing the probability of future shipments to fulfill their 55,000 ton promise.

CONSIDERABLE lobbying is under way in France by various steel interests who are anxious that the two continuous strip mills previously reported should be allocated as part of their respective works. A declaration recently made by Jacques de Nervo, president of the blast furnaces and steelworks company of Denain & Anzin, at

FRENCH STEEL PRODUCTION

(Thousands of Tons)	1938 Monthly Average	1945 Monthly Average	April 1946	May 1946
Pig iron.....	551.1	108.9	253.00	277.2
Steel.....	569.8	150.7	351.23	376.2
Finished products.....	376.2	101.2	247.5	268.2
Tubes.....	16.72	10.87	14.85	15.4
Wire products.....	29.7	12.1	20.9	19.8
Cold-drawn.....	17.59	2.86	8.47	8.8
Cold-rolled.....	5.72	5.28	3.85	3.96

In comparison with the monthly average for 1938, production figures for May 1946 show the following percentages: Pig iron 50 pct, steel 66 pct, finished products 71 pct, tubes 92 pct, wire products 67 pct, cold-drawn bars 116 pct, cold-rolled products 68 pct.



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their recent annual meeting, underlines the favorable position of these works for the construction of one of the proposed strip mills. He said: "The erection of two continuous strip mills in France has been recognized as indispensable to the organization of the country. Our works are especially well adapted to this plan owing to the importance of their steel capacity and their particularly large production of flat products which could be taken over by the new strip mill. All these works will be part of the general modernization program of the French iron and steel industry which at this time is about to be fixed."

Present indications are that the specifications for the two strip mills will call for an ultimate capacity of 495,000 tons each, but there will be an interim stage at which a total production of 770,000 tons for the two plants will be the target, with the 990,000 ton figure being the ultimate.

Iron ore production, figures for which are available only through April, stood at a level of 1,408,000 tons, about the same as for the previous month, compared with a monthly average of 3,030,500 tons for 1938. Deliveries to French steelworks amounted to 565,400 tons, and ore exports increased to 489,500 tons against 470,800 in March. The bulk of the exports is sent to Belgium and Luxemburg, but the excess of ore supplies is be-

ginning to present a difficult storage problem. Stocks of ore at the end of April totaled 7,461,300 tons compared with 7,132,400 at the end of March.

A new commercial agreement is under discussion between Belgium and France, and one of the important issues involved is the exchange of French iron ore for Belgian coke. French leaders are expressing some concern at present as to the possibility of losing iron ore customers due to strong competition from Sweden. The Scandinavian country having lost its principal customer, Germany, is now making a strong bid for new markets. The following figures indicate the total amounts of Swedish ore exported to Germany during the war:

1939.....	15,015,000	tons
1940.....	11,150,700	"
1941.....	10,492,900	"
1942.....	9,492,300	"
1943.....	11,266,200	"
1944.....	5,720,000	"
1945.....	1,342,000	"

AS PREVIOUSLY reported, the modest iron and steel production of the Ruhr today is consuming home ore and the remnants of some stocks of high grade foreign ore. As a result, Sweden must find new markets for its iron ore and obtain some coal and coke which it lacks completely. Before the war Great Britain supplied Sweden with 68 pct of its imports of coking coal and 57 pct of its remaining coal needs. In a period of international

coal shortage Great Britain is no longer in a position to export appreciable amounts of coal, and Sweden has not been too successful in obtaining allocations from the Ruhr. Wielding the only available economic club at hand, Sweden has recently offered to suspend its timber exports to Great Britain unless it receives more coal from the Ruhr.

Sweden has recently concluded an agreement with Poland calling for exchange of coal for high grade Swedish ore, but the internal transport problem in Poland will make deliveries on this agreement slow and the Russians retain a priority on Polish coal exports in amounts running into millions of tons. The difficult transportation problem to boarding ports will also tend to limit the amount of ore which Sweden can hope to barter in exchange for Czechoslovakian coal although efforts are being made in this direction.

The issue involved as far as the Belgians are concerned weighs the relative merits of high grade Swedish ore against the lower grade Lorraine ores. It seems likely that in the circumstances Belgium will be able to continue to drive a shrewd enough commercial bargain to increase her consumption of Swedish ores, but not to the exclusion of French ores.

## Shortages Slow Output

### London

• • • British steel manufacturers' efforts to achieve maximum production will be checked this month owing to the continued scarcity of supplies. It is understood that on July 17 there was a cut in coal supplies for coke ovens, many of which are attached to steelworks. The effect of holidays in the coal-mining and steel industries has been the cause of this cut.

Steel production in the Midlands will shortly reflect the reduction made in coal supplies to steel manufacturers in that area during June, the loss in output being estimated at 4400 tons per week. Owing to the Whitsun and Victory holidays it is expected that June steel production figures will show a lower average output rate than in May.

**BRITISH BABY:** Even in England, land of small cars and high auto taxes, this car is considered rather tiny. Originally designed for disabled persons, it is a single seater Larmer powered by a 2½-hp motor which drives it at 30 to 40 mph. Gas consumption is reported to be 65 miles per gal.



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# PERSONALS

• • •

• **Don H. Proctor** has been appointed chief sales engineer of Lovejoy Tool Co., Inc., Springfield, Vt. He has been with the company 28 yr in a manufacturing and selling capacity. Effective Aug. 1, Mr. Proctor's place as New England district representative will be taken by **A. M. David**.

• **John R. Craig**, recently released from active Naval service, has been appointed assistant to the vice-president in charge of sales of the Taylor-Wharton Iron & Steel Co., Easton, Pa.

• **G. J. Dekker**, manager of the Detroit district for Air Reduction Co., Inc., has been elected a vice-president of Ohio Chemical & Mfg. Co., Cleveland, a subsidiary of Air Reduction. **Stephen H. Newburn**, manager of the Cleveland district, succeeds Mr. Dekker in Detroit.

• **Harry E. Cardoze, Jr.** has been appointed Nash Motors Div.'s assistant organization manager of Nash-Kelvinator Corp., Detroit. **Lawrence D. McCartney** has been appointed assistant Nash Motors sales office manager, succeeding **E. W. Hoffman**, who has become comptroller of Nash's Cleveland zone.

• **Edward C. Bayerlein**, chairman of the board of the Nordberg Mfg. Co., Milwaukee, and who started with the firm 52 yr ago as an assistant bookkeeper, has retired.

• **Edward W. Welp** has been named sales manager of water conditioning equipment of the Graver Tank & Mfg. Co., Inc., E. Chicago, Ind. Mr. Welp, former technical director of Graver's Process Equipment Div., has spent 32 yr with the firm in every phase of research, design and construction of water conditioning equipment.

• **William C. Kunkelman** has been appointed sales engineer of the Carpenter Steel Co., operating from its Cincinnati branch. Mr. Kunkelman was recently discharged from the U. S. Infantry after 4 yr service.

• **Jesse J. Shuman**, inspecting engineer for the Jones & Laughlin Steel Corp., has retired after 46 yr service with the corporation. He started with Jones & Laughlin as an engineer at its Pittsburgh works. For a number of years Mr. Shuman served as the J&L representative on all steel technical committees.

• **Donald A. Potter** has been appointed research and development engineer for Universal Castings Corp., Chicago. He had been associated with E. C. Atkins Co. as a chemist and metallographer over a period of 2 yr, and was recently discharged from the Navy.

• **Charles Collins** has been elected vice-president in charge of sales and advertising of the Gerotor May Corp., Baltimore. He has been associated with the sales dept. of Gerotor May since 1928, and has served as general sales manager and advertising director since 1940. **T. A. Button**, plant manager at Gerotor May since 1944, has been named vice-president in charge of production.

**CHARLES COLLINS**, vice-president in charge of sales and advertising, Gerotor May Corp.



• **Com. B. R. Queneau** has been appointed chief development metallurgist at the S. Chicago plant of the Carnegie-Illinois Steel Corp. Prior to the war Commander Queneau had been employed at the Duquesne plant of Carnegie and later at the U. S. Steel research laboratory at Kearny, N. J. He was an assistant professor of metallurgy at Columbia University before going into the Navy.

• **Lester Campbell**, chief of the engineering staff of Foster Machine Co., Westfield, Mass., will resign as of Aug. 1. He has been associated with the company nearly 50 yr, and for a long period was assistant superintendent and mechanical superintendent, respectively.

• **Thomas G. Franzreb** has been appointed to the Technical Service Div. staff of Turco Products, Inc., Los Angeles.

• **C. H. Lenhart** has been appointed assistant general superintendent of Kaiser Co., Inc., Fontana, Calif. Prior to this appointment, Mr. Lenhart was superintendent of the blast furnace dept. **J. M. Hooper** has been appointed assistant general superintendent. He was formerly superintendent of the rolling mills dept. **E. J. Duffy** has been promoted from assistant superintendent of the blast furnace dept. to the position of superintendent of the department. **J. E. Macorey** has been promoted from assistant superintendent of the rolling mill dept. to superintendent of the department. **C. A. Herbert** has been appointed superintendent of the tube mill which is now under construction. Mr. Herbert was formerly with the Salem Engineering Co. **B. A. Shrive** has been named superintendent of maintenance. He was formerly associated with the Steel Co. of Canada, Ltd. **W. R. Crampton** has been appointed superintendent of yards, roads and transportation. He recently resigned from the Interstate Commerce Commission, and was formerly employed by the Republic Steel Corp. And **Robert C. Madden** has been appointed superintendent of metallurgical, inspection and chemical laboratories. Previous to his service in the Navy, he was associated with Bethlehem Steel Co.

## PERSONALS



**LESLIE B. WORTHINGTON**, president, U. S. Steel Supply Co.

• **Leslie B. Worthington**, formerly sales vice-president, has been elected president of the U. S. Steel Supply Co., Chicago, a U. S. Steel subsidiary, succeeding **Ernest E. Aldous** who has retired from the presidency after 45 yr service with U. S. Steel subsidiaries. Mr. Worthington began his career with the U. S. Steel subsidiaries in 1923 as a sales apprentice at the S. Chicago works of Carnegie-Illinois Steel Corp. He was elected vice-president of U. S. Steel Supply in 1942, and continued in this position until his current promotion.

• **Norman A. Purdy**, former superintendent of the Chrysler Tank Arsenal, has been placed on the general manager's staff of the Chrysler Corp., Detroit, in charge of the automobile quality inspection dept.

• **Norman H. Shipley** has been appointed district manager of the American Car & Foundry Co.'s Madison, Ill. plant. He has been with the company for 34 yr serving in various capacities at the St. Louis plant until his appointment in 1941 as assistant district manager at Madison. **Harold L. Kennedy** has joined American Car & Foundry Co. as sales agent at the Washington district sales office. He was recently Washington district sales manager for the Mt. Vernon Car Mfg. Co.

• **M. F. Rummel**, who has been identified with Pontiac Motor Div. of General Motors Corp. since 1927, has been named purchasing agent of that organization. He was appointed assistant purchasing agent of the manufacturing plant in 1941, and in April of 1946 was made acting purchasing agent.

• **Harvey E. Schroeder**, formerly district manager in Los Angeles for the Parker Appliance Co., has been appointed manager of a newly created Pacific division of the company. Mr. Schroeder succeeds **Paul Locklin** who has resigned as manager of the company's Los Angeles Manufacturing Div.

• **William Rodder**, chief engineer, Aetna-Standard Engineering Co., Youngstown, Ohio, for the past 8 yr, has been made director of engineering. **Perry Snyder**, formerly associated with the Youngstown Sheet & Tube Co., succeeds Mr. Rodder.

• **Orville O. Kenworthy**, recently discharged from the U. S. Army, has been added to the staff of the Color Div. of the Ferro Enamel Corp., Cleveland.

• **Pem W. Taylor** has been appointed sales representative for North Carolina, South Carolina, Georgia, Florida and Alabama of the Titan Metal Mfg. Co., with offices in Atlanta.

• **George B. Proud**, treasurer of Western Electric Co., New York, since 1941, will retire on Oct. 31, following 37 yr of service with the company. **H. Hastings Reddall**, chief auditor, has been elected to succeed Mr. Proud on Nov. 1.

• **Neil A. Benson** has been appointed plant manager of the Will-Burt Co.'s plant No. 1 at Orrville, Ohio.

• **Charles D. Manhart** has been named sales manager of the Bendix Aviation Corp.'s Products Div. South Bend, Ind., and **I. F. Richardson** has been appointed assistant sales manager.

• **Roland S. Higgins** has joined Hydropress, Inc. as sales representative and head of the Detroit branch office.

• **George L. Abbott** has been appointed president and treasurer of the newly formed Warren Belting Co., Inc., Worcester, Mass. He recently resigned as general sales manager and vice-president of Graton & Knight Co.

• **Edwin R. McPherson** has been appointed plant engineer and **Francis W. Gardner**, head of the standards dept. of Wilson Foundry & Machine Co., Pontiac, Mich. Mr. McPherson joined the Wilson organization after serving as plant engineer and general superintendent of maintenance, construction and services for Campbell, Wyant & Cannon Foundry Co. of Muskegon. He has also been connected in an executive engineering capacity with Packard Motor Car Co., Crosley Corp. and Wright Aeronautical Corp.

• **O. Hammer** has been elected president and general manager, Security Engineering Co., Whittier, Calif., one of the Dresser Industries, succeeding **W. E. Sievers**, who has been elected chairman of the board. Mr. Hammer has been associated with Security Engineering since 1931.

**O. HAMMER**, president and general manager, Security Engineering Co.



• **Derward Smith**, general accountant for the Tennessee Coal, Iron & Railroad Co., Birmingham, has been appointed an assistant comptroller.

• **Howard D. Herbert** has joined the Restfoam sales dept. of Hewitt Rubber Corp. at the Buffalo headquarters. Mr. Herbert served the Goodyear Tire & Rubber Co. for 15 yr and has been manager of Airfoam sales since 1940.

• **George L. Bauer** has been appointed eastern division manager for the Kerkling & Co.'s Industrial Div. located in Chicago.

• **William C. Scheutzw** has been made a representative in the Cleveland area of the Lamson & Sessions Co. He has been employed by the company since 1923.

• **Jordan K. Silver** has been appointed manager of the New Haven, Conn. branch of the Westinghouse Electric Supply Co., succeeding **Henry E. Mitchell**, who will continue as special representative. Mr. Silver joined the Supply Co. in 1919.

• **E. W. Gaughan** has been made assistant manager of the Westinghouse Electric Supply Co., New York. He was formerly appliance manager in the west central district.



C. J. DUBY, general superintendent in charge of flat rolling, Warren district, Republic Steel Corp.

• **C. J. DUBY** has been appointed general superintendent in charge of all flat rolling in the Warren, Ohio district of Republic Steel Corp. Mr. DUBY has been chief engineer of the district since 1933. **H. K. Ihrig**, former assistant chief engineer of the Warren district, succeeds Mr. DUBY as chief engineer.

• **John J. Palmer** has been named manager of the Newport News, Va. plant of Gar Wood Industries.

• **Frank B. Stratton** has been named industrial commissioner for the Western Pacific Railroad with offices in San Francisco to succeed **James W. Grace** who has retired after 23 yr with the company.

• **J. C. Billings** has been appointed supervisor of tire distribution for the Replacement Tire Sales Div. of the B. F. Goodrich Co., Akron, Ohio, succeeding **R. R. Huston**, who died recently. With the company 20 yr, Mr. Billings had been sales manager of industrial tires for the last 2 yr.

• **Charles K. West**, commercial vice-president of the General Electric Co. in charge of the Atlantic district with headquarters in Philadelphia, has retired after more than 47 yr of service. **O. F. Haas**, manager of the Continental sales district of the lamp dept., also with headquarters in Philadelphia, succeeds Mr. West in charge of the Atlantic district. **G. R. LaWall** has been appointed quality control engineer in the Wiring Device and Accessory Equipment Divs. of General Electric Co., Bridgeport, Conn. He began his association with GE in 1919. In 1942, he was assigned to design styling in the wiring device engineering section and, in 1945, became an engineer in the Wiring Device and Accessory Equipment Divs.

• **Albert R. Stedfast**, 75, president of Stedfast & Roulston, Inc., Boston, died July 7. He founded the company in 1927.

• **Birney M. Bickford**, assistant works manager of the Plymouth Div. of Chrysler Corp., Detroit, died recently.

• **William F. Disch**, 65, secretary of the Wrought Washer Mfg. Co., Milwaukee, and associated with the firm for 38 yr, died July 9.

• **Ellery Peabody**, 82, president of the Ashton Valve Co., Cambridge, Mass., from 1908 to 1943 and chairman of its board of directors from 1943 until his retirement last year, died July 10.

• **Hillman J. Eckerson**, assistant general manager of the L. A. Young Spring & Wire Corp., Detroit, died recently.

## ...OBITUARY...

• **Walter J. Ahern**, 46, president, Best Steel Co., Cleveland, died July 14 at his home in Mentor, Ohio. Formerly associated with the Franklin Steel Blanking Co., he organized his own concern 8 yr ago.

• **William H. Snyder**, 56, veteran purchasing agent for Republic Steel Corp. and a predecessor company, Corrigan-McKinney Steel Co., died July 15. Mr. Snyder had been with Republic and Corrigan-McKinney for 32 yr.

• **Augustus C. Durdin, Jr.**, one of the founders of the Chicago Pump Co., Chicago, and executive vice-president of the company when he retired in 1941, died July 10 at his home in Birmingham.

• **Hobart M. Bird**, 51, president of Columbia Steel Casting, Inc., Portland, Ore., died July 6. Except for a period of 16 months in active service during World War I, Mr. Bird had been with Columbia since 1917. He retired in January of this year, but had returned to his office in March.

• **John J. Stanton**, 59, former general manager for the Westinghouse Mfg. Co., Wisconsin and Upper Michigan, died July 8 after several years illness.

• **William P. Newman**, retired purchasing agent of Robins Conveyors Inc., Passaic, N. J., division of Hewitt-Robins Inc., died after a brief illness on July 17.

• **Frederick L. Eberhardt**, 78, chairman of the board of Gould & Eberhardt, Newark, N. J., died July 18.

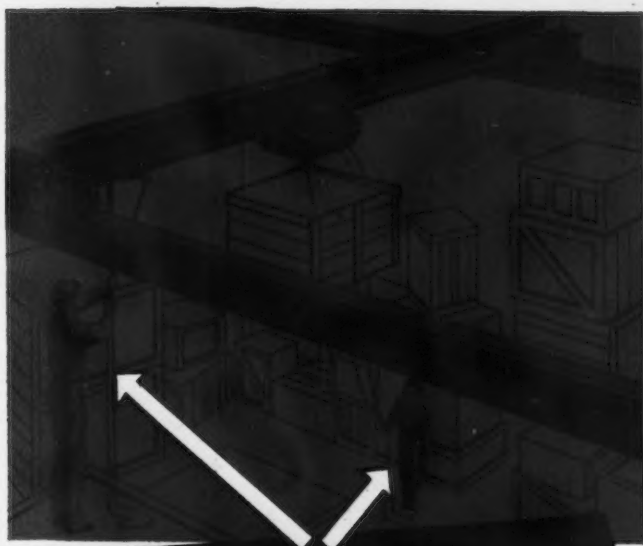
YOU DON'T NEED

# "PULL"

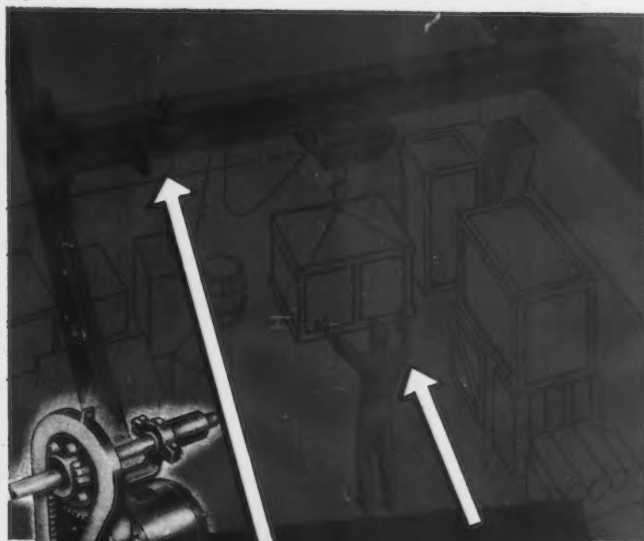
IF YOU HAVE A

## Northern TRAVELATOR

MOTOR TRAVEL FOR HAND TRAVELED CRANES



Without the Travelator an extra man has to pull on the travel chain as he climbs around boxes or other materials by the wall.



With the Travelator, the man at the hoist travels the crane by push button control. No chain pulling—no climbing.

The Patented Northern Travelator eliminates the "pull" in hand traveled cranes—provides electric motor power travel with pendant push button control.

It provides faster, easier operation—makes the crane far more serviceable and satisfactory.

And—it's economical to buy—very easy to erect. Any good mechanic can apply it to your crane in less than half a day. No part of the crane is removed or dismantled, except the pull chain.

*Thoroughly Reliable...  
Durable...* WRITE FOR BULLETIN T-2

### NORTHERN ENGINEERING WORKS

2615 Atwater Street, DETROIT 7, MICH.

Offices in Principal Cities

# Dear Editor:

## STEEL EXTRAS

Sir:

This agency is responsible for the selling of surplus ferrous and non-ferrous material. . . . In the process of selling this material we very frequently refer to the prices published in your magazine for the base mill prices. However, your prices do not cover extras which very often apply to different products. As we have very limited information on extras, would you be kind enough to furnish us with this information. . . ?

H. L. WARD  
Acting Chief

Metals Branch  
War Assets Administration  
Detroit 26

● Our files on mill and warehouse steel extras occupy a 12-ft shelf, and this does not include nonferrous price extras. Extras must be calculated for each individual order; there is no formula which would cover a general situation. We would recommend that you obtain the latest list of extras from leading mills and warehouses. This would permit you to determine the extras applying to the specific lot of steel you have in mind. The same situation applies to nonferrous prices.—Ed.

## APPROVED DEALERS

Sir:

I noticed an item on p. 140, June 13 issue, "WAA Adds Approved Dealers Licensed To Sell Surplus Material." I would like to obtain the list of 2187 "approved dealers" referred to in the article and would appreciate your advising me through what source I can obtain same.

W. J. PARKER

W. J. Parker, Inc.  
New York

● The list was prepared by the War Assets Administration. We have requested the WAA to forward you the complete list of approved dealers licensed to sell surplus machine tools.—Ed.

## FLAME HARDENING

Sir:

We would like to receive 12 copies of the article entitled "Flame Hardening Standardization," by A. L. Hartley, as reprinted from the issues of Oct. 17, 24, 31, Nov. 7 and 14, 1940.

B. W. BISE

Linde Air Products Co.  
Indianapolis

● Our supply of reprints of that article is exhausted. However, the Indiana State Library has been a subscriber to THE IRON AGE for many years and maintains bound copies of the issues. It is most likely that you can obtain photostats of the article from the library at a nominal cost.—Ed.

## PRECISION CASTING PATENTS

Sir:

The answer in "Dear Editor" of the June 20 issue on "Precision Casting Patents" seems to have missed the vital point, centrifugal casting of the wax pattern v. centrifugal casting of the metal. The decision makes it clear that firms not using centrifugal casting as a means of making the wax patterns do not infringe. Firms using centrifugal casting of the metal in the final mold, if the wax pattern was not cast centrifugally, do not infringe.

PRECISION CASTER

New York

## RUST PREVENTIVES

Sir:

Would you be able to send me a reprint or tear copy of the article "Specifying Rust Preventives" by J. Albin, which appeared in the June 7, 1945 issue, pp. 52 to 59.

MARTIN J. GARRETT  
Research Chemist

Pacific Chemical Co.  
Los Angeles 12

● Tear sheets have been mailed.—Ed.

## VAPOR CLEANING MACHINE

Sir:

We would appreciate your giving us the name of a manufacturer of a unit electrically operated which, we believe, creates steam for cleaning grease from farm machinery. We believe the name is Kerich.

H. L. APPLETON

Murta, Appleton & Co.  
Philadelphia

● You probably have in mind the Kerrick vapor cleaning machine manufactured by the Clayton Mfg. Co., Alhambra, Calif.—Ed.

## MAGNESIUM ALLOY FINISH

Sir:

We would appreciate it very much if you would forward tear sheets from the Mar. 21 issue of the article by R. B. Mason titled "A Protective Finish for Magnesium Alloys."

L. S. WILLIAMS

Chief Chemist  
Canadian Hanson & Van Winkle Co., Ltd.  
Toronto 3, Canada

## THE PARIS FAIR

Sir:

We have formed the habit of looking to THE IRON AGE for authoritative information. Perhaps this is the reason we were so disappointed that Mr. Hight in his European letter in the issue of June 6 stated that machine tools at the Paris Fair came

from Paris, Vienna, Turin, Milan, Basel, Coventry, Cincinnati and Milwaukee. Machines from Waynesboro were also present. We realize that your correspondent did not attempt to list the origin of all the exhibits but we do feel that having mentioned two American sources, the same degree of recognition might have been accorded another equally important supply source. . . .

J. C. L. BROWN  
Advertising Manager

Landis Tool Co.  
Waynesboro, Pa.

● We asked Jack Hight, our European correspondent, if he were picketing Waynesboro tools. Jack's reply, which we quote herewith, is an eloquent understatement: "Because of the altogether delightful French system of organization, that is, no press information, no catalog or directory, tools mixed with gas stoves, cut glass, textiles and hidden in crowded corners where only the French secret police would have been able to find them, it would have been a physical impossibility to try to list the source of every machine. I took the second alternative, that of trying to give some typical samples, being at the same time aware that every company that had tools at the Paris Fair deserved a gold medal for ingenuity and perseverance. Mere mention in THE IRON AGE is no fitting tribute for such firms."—Ed.

## FERROPHOSPHORUS MAKERS

Sir:

We should feel obliged if you would kindly advise us the names and addresses of the makers of ferrophosphorus in your country.

T. M. HITCHISON

Drummond, McCall & Co., Ltd.  
Montreal, Canada

● A list has been forwarded.—Ed.

## METAL FINISHING

Sir:

Enclosed please find 50¢ for which please send us a reprint of the series "Metals, Finishes and Finishing Processes" by Edward Engel.

FREDERICK H. DAVIS

American-British Chemical Supplies, Inc.  
New York 16

● Reprints have been sent.—Ed.

## HOW TO WELD ALUMINUM

Sir:

Kindly forward six copies of the article "How to Weld Aluminum" which appeared in the June 20 issue of your magazine.

C. E. HYSKELL

Aircraft Engineering Products, Inc.  
Clifton, N. J.

## SHOT PEENING

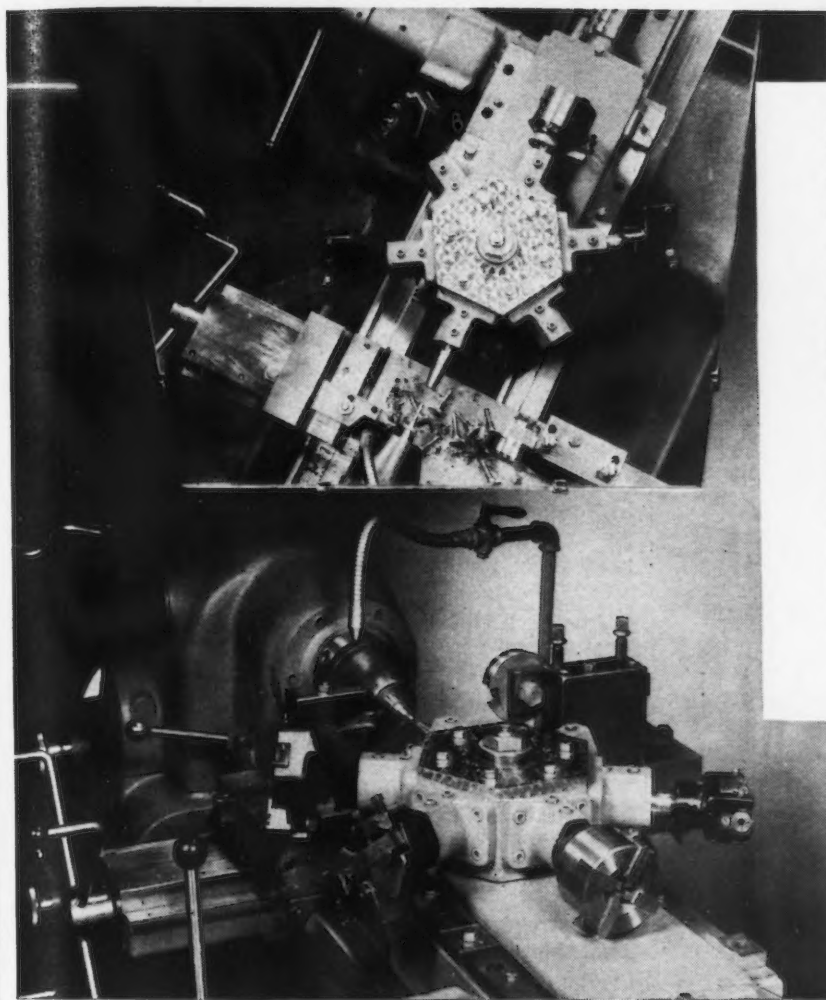
Sir:

We are attaching hereto \$1.00 in cash, for which please send us two copies of the booklet on "Shot Peening."

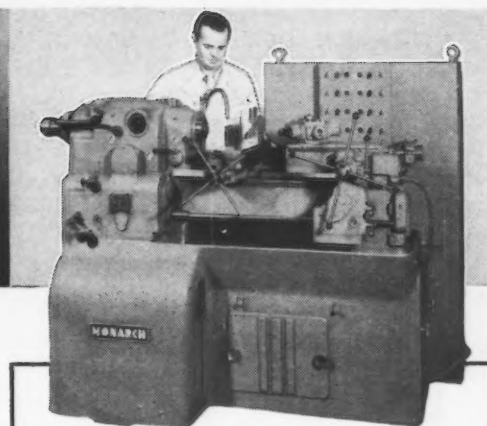
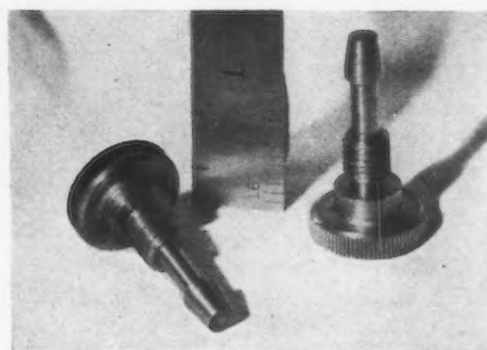
H. MILLER  
General Manager

Fort Pitt Spring  
H. K. Porter Co., Inc.  
Pittsburgh

# 1.38 MINUTES FROM BAR TO FINISHED PART



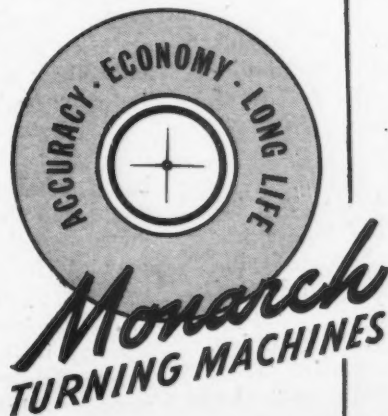
Part—Stop Screw, Knurled Head  
Material—1315 Steel,  $\frac{3}{4}$ " Diameter  
Preselected Spindle Speeds—6  
Time per Piece—1.38 Minutes  
Setup Time—54 Minutes



*Speedi-Matic Production: 43½ Screws Every Hour!* The Monarch Mirror tells the story—18 surfaces machined in six cuts.

Jobs like these are the reasons why users everywhere call the Speedi-Matic "the world's fastest hand screw machine". For toolroom accuracy at production line speed—on lots of 25 to 500 or higher—you can't beat the Speedi-Matic. Get the full facts *now*, while deliveries are still favorable.

THE MONARCH MACHINE TOOL CO.  
Sidney, Ohio



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AT A PROFIT  
SPECIFY SPEEDI-MATIC**

*Here's what you get:*

- Automatic electronic speed change, preselected for as many as ten stations.
- Complete range of spindle speeds—50 to 5000 rpm.
- Feeds from .0005" to .016" per revolution.
- Power feed ram-type turret.
- Spring-return hand-operated cut-off slide.
- Air-fed pusher-type collet attachment.
- Collet chuck capacity— $\frac{7}{8}$ ".

# This Industrial Week . . .

- **Steel Rate Belies Pessimistic Forecasts**
- **Rises 1½ Points to 90.5 Pct of Capacity**
- **Freight Car Shortage Hits Steel Shipments**

**H**ARKING back to wartime days when production miracles were the rule rather than the exception the steel industry this week, unmindful of some dire predictions about sharp declines in operation because of scrap shortages, actually boosted its ingot rate 1½ points to 90.5 pct of capacity.

This is a new postwar high in operating rates and comes at a time when some talk was emanating from governmental and even steel circles to the effect that steel operations would decline as much as 30 pct within a short period. Scrap inventories among steel mills are at a low point—probably the lowest in several years.

However, this week factors are at work which, although they will not eliminate the possibility of a scrap shortage, will nevertheless have some bearing upon future steel operating rates. By using all the production short cuts learned during the war, most steel companies have been able to maintain a relatively heavy schedule in their steelmaking departments.

With OPA slated to be reinstated, it can be expected that tonnages of scrap which have been held back for higher prices on the basis that OPA would be completely eliminated will start to flow to steel plants. Not all of this hold-back tonnage was in the hands of dealers and brokers. Some portion of it was being held back by manufacturers who will now let loose of some of this material.

**A**NOTHER factor which may increase the flow of scrap is the overall step-up in manufacturing operations during the past month. Scrap from this source is an important contribution to total scrap tonnages. Another aid to the present situation has been the blowing in of additional blast furnaces during the past few weeks, the output of which will be almost completely utilized for steelmaking purposes.

The surprisingly good showing in raw steel output, however, is not necessarily an indication of better deliveries and shipments to steel consumers. The steel industry this week, as well as its customers, is being plagued by a serious car shortage. This time all types of cars are involved. In one important district producers were unable to move 12,000 tons of bars and shapes this week because of the car shortage. In another instance 2500 tons of flat-rolled products had to be stored until box cars were available.

Steel firms are making every effort to unload incoming cars and are paying time and a half for the loading of what few cars are available. Storage facilities originally planned for immediate transfer of finished goods into freight cars are being cramped and rolling schedules may have to be curtailed because of the freight car shortage.

In June the number of freight cars delivered to the carriers was more than 700 less than in May, thus

indicating the difficulty of car builders in obtaining a balanced supply of material. The backlog of freight cars on order is substantial while the actual output is far less than is necessary to replace worn out equipment. The inability of railroads to retire worn out rolling stock is also a factor in the scrap shortage. Were sufficient volume of new freight cars available, scrapping of old units would add considerably to the supply of good grades of steelmaking scrap.

Domestic steel consumers received another setback this week when CPA decreed that 2 pct of all steel products made by any company must be set aside for export. Firms not generally in the export business argue that it would be difficult to supply such a percentage without seriously affecting their domestic orders which are on a quota basis. The United States has been under considerable pressure to ship more steel abroad while American steel firms have insisted that the domestic picture, seriously interfered with by strikes and shutdowns, should be straightened out first.

**I**F the present OPA bill is passed as is and signed by Mr. Truman it can be expected that the steel industry will soon come in for increases on those products which are not paying their way in the total price picture. It is further expected that in that case the industry in collaboration with OPA will attempt to wrap up all the price inequality problems so that when an advance is finally made a balanced price structure conforming to regular peacetime practice will result.

Nevertheless, on the assumption that average price levels of 1940 will constitute the base and that manufacturers will be allowed that factor plus increases in costs since that time, considerable discussion must be held before a price advance is worked out. It is expected that while OPA has voluminous facts on 1940 steel costs it will be necessary to deduct what cost-increase factors have been compensated for by steel price advances made since 1940. Because of the serious mauling OPA received during the period preceding the present legislation that agency will probably show a little more speed and understanding of industry problems than heretofore.

In retrospect, there were no steel price advances during the interim period when the price bill was being debated. Only one pig iron price advance was made and that was in one district and was not followed by other districts. Scrap prices generally held firm at old OPA ceilings with the exception of cast iron scrap, which constitutes a small part of the overall scrap tonnage. There was however some overgrading in the scrap market in recent weeks when inferior grades brought the same amount as prime grades. This practice however has cropped up often during periods of tight supply.

• **STAINLESS STEEL**—While some observers have felt that there might be a break in stainless, new orders are still being received in substantial quantities at the full market price and backlogs are still a headache to producers. Consequently, with stainless still in a seller's market, it is difficult to find any reason for a break in prices. Allegheny Ludlum is striving hard to get its new four high tandem strip mill into operation at the new Leechburg plant. It was scheduled for operation in June, but now it appears that it will not be operating until November. The new Washington Steel Co. is doing some sheet polishing, but operations of its strip rolling equipment have been delayed until sometime between October and January, next year. Electrical equipment, especially motors, is the holdup.

• **CONCRETE BARS**—Some 70,000 tons of concrete bar business from the areas east of the Rocky Mountains and north of what might be termed the Birmingham selling area are going begging for a producer. Mills are producing far less than the demand and many are producing far less than they normally do. The largest single factor holding up bar production is price, which in turn limits the amount of steel and the time permitted on bar mills for the production of concrete bars. Steel producers are directing steel and mill space into more profitable items and large construction projects are finding it impossible to find producers who will take reinforcing bar orders.

• **ITALIAN STEEL PRODUCTION**—Current production represents slightly over 25 pct of the Italian steelworks' capacity, and new allocations from the European Coal Organization promise increased output in the next few months. The amount of coal scheduled for export to Italy during June was 275,000 tons, but statistics are not yet available as to the actual deliveries.

• **EUROPEAN ROLLING STOCK**—The census carried out by the European Central Inland Transport Organization indicates that despite war damage there are still 60,000 locomotives, 98,000 passenger cars, and 1,160,000 freight cars left on the European railroads, about 85 pct of the prewar total. France, Holland and Poland suffered most heavily, with France accounting only 200,000 freight cars left of a prewar total of 450,000. Taking into account 100,000 foreign cars in use in France, there is about two thirds of the prewar capacity available today. The transport organization hopes that traffic will be almost normal some time in 1947.

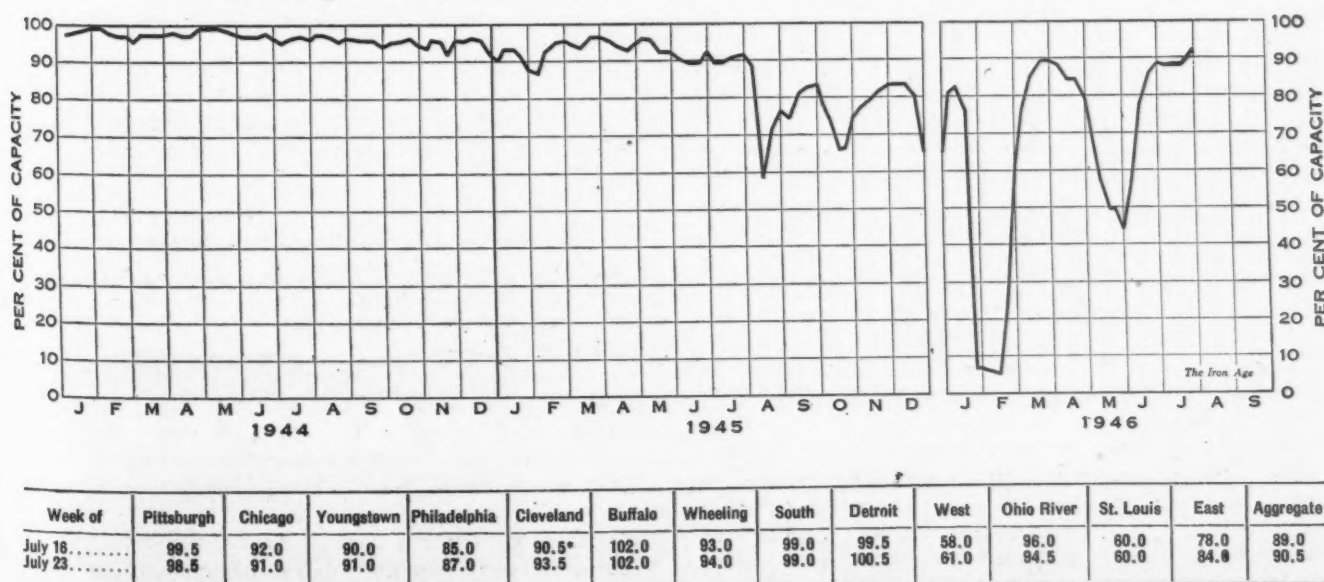
• **ALLOY STEEL**—With about 60 to 65 pct of the alloy bar business going into the automotive field, very active purchasers at the present time, there is very little chance of new buyers finding space on mills. Both incoming business and backlogs create a very healthy situation for alloy plant operation through September. Small mills are filled pretty well throughout the remainder of the year, while there is some space on larger mills in the last quarter. On flat-rolled, the supply situation is pretty tight, with manufacturers of various types of gas cylinders and tanks, aircraft, and other commodities requiring alloy sheets filling mill books for the remainder of the year. Mills are attempting to eliminate such orders as could be satisfied with carbon steels, but apparently price is not an object to consumers and, especially on bars, consumers who could use carbon bars but can't get them are turning to alloy. Apparently there is a great deal of potential business for alloy plates that will be coming out during the balance of the year.

• **BRITISH STEEL OUTPUT**—Steel production in the United Kingdom during the second quarter of 1946 totaled 3,671,000 tons, compared with 3,307,900 tons for the same quarter last year and 3,532,700 tons for the first quarter of this year. Pig iron production for the second quarter of this year totaled 2,191,500 tons, compared with 1,930,300 tons for the same period last year and 2,118,400 tons for the first quarter of 1946.

• **URANIUM AT KRUPPS**—Three quarters of a ton of uranium ore has been found at Krupps' devastated factory at Essen, Germany, and has been shipped to the United Kingdom. Uranium oxide was known to have been used in Krupps for experimental work on production of especially hard steel for projectile noses. After a prolonged search the ore was found under the ruins of a store shed which had been blasted by heavy bombs. The ore was confiscated under the clause of the Potsdam agreement forbidding German possession of such metals.

• **FRENCH SCRAP FOR POLISH COKE**—The central supply of the Polish national steelworks has proposed that France and Belgium export 50,000 tons of scrap in exchange for Polish coke and coal. The French press is pointing out that although present French scrap resources are ample for today's needs there is a definite limit, and the demand of French blast furnaces and steelworks is growing as they are attempting to use the maximum of scrap to save fuel. Part of the existing scrap supplies is also described as artificial inasmuch as it is derived from the demolition of buildings, bridges, and other war damage.

Steel Ingot Production by Districts and Per Cent of Capacity

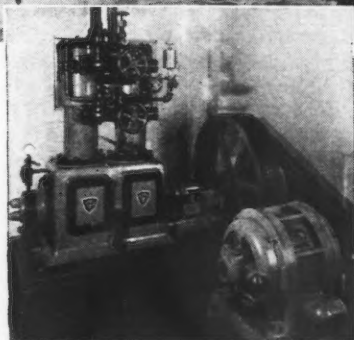


\* Revised.



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PACKAGE MFG. CO., CHICAGO

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A wide variety of fastenings made from Brass, Naval Bronze, Silicon Bronze, Monel and Stainless are available for prompt shipment from large Harper Stocks. Harper's Special Engineering facilities serve the Refrigeration Industry constantly.

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*Chicago*

## Bookings Solid Through '46; Orders Squeezed by Backlogs

### Pittsburgh

• • • Flat rollers, especially producers of galvanized sheets and cold-rolled sheets, are finding themselves in difficulty because of the CPA certification program that permits only a 30-day lead time in order bookings. Manufacturers point out that their schedules are set up at least 30 days ahead of production and certified orders generally reach the scheduling department about a week after mill schedules are established. The result is that these schedules have to be torn apart and the certified tonnages booked.

Most mills have not opened their order books for first quarter of next year on steel products. As to sheet and strip, both hot and cold rolled, mills are sold out for the balance of this year and all anticipate a substantial carryover into next year because of the CPA certification system. Bookings of certified tonnage while not a large percentage of the total actual capacity, become a substantial part when it is considered that considerable tonnage is required for warehouses and for contract customers such as subsidiary fabricating plants of sheet producers. Order books for the first quarter of 1947 will probably be opened about Sept. 15 by most mills, but it is likely that carryovers will permit bookings of only about 50 pct of the capacity of the sheet and strip production for the first quarter.

Plate production has suffered tremendously during the first six months of this year for a variety of reasons. First, of course, were the steel and coal strikes. It is estimated that from three to four months production was lost because of strikes. Further, plate production capacity has been shrinking steadily since the end of the war because strip and sheet mills went back to their normal product and many mills are interested only in special grades because they are unable to profitably manufacture regular carbon grades of plate. As in most steel products, producers have set up their own allocation system to take care of their regular customers and there is scarcely any available capacity for new business

By T. E. LLOYD  
Pittsburgh Regional Editor

• • •

throughout the remainder of the year. As a matter of fact, it is the opinion of analysts in the industry that it is impossible to place any sizable tonnage of plate orders in the United States.

Structural steels are pretty much in the same situation as plates, with thousands of tons of new business being turned down. The first job of the plate and structural mills is to discharge the heavy backlogs of orders, and because it is difficult to estimate the capacity of the industry for plate (because of the reduction in capacity since the end of the war) an estimate of the backlogs in terms of months-shipsments is practically impossible. Plate fabricators have been getting dribbles of plates and structurals into their shops, but it is believed that the supply situation will get worse before it gets better. Consequently, it would not be too far fetched to forecast that some plate fabricators may have to close up shop from time to time during the balance of this year and part of next.

Wire products such as manufac-

turers wire, nails, fencing, and barbed wire, are in scarce supply throughout the balance of this year. There is probably some capacity open on specific manufacturers' wire items during the last half of this year. The recent price increase on nails is reported to be bringing out considerably greater quantities of nails, especially from some of the smaller Middle West producers. Observers point out that it will take from six to eight months of present production rates to catch up with the excessive demand.

While price is a major factor on welded and wrapped wire fencing, the demand is very great and mills consider these items quite critical. The industry asked for a \$10 a ton increase when OPA still existed, but the price increase never came through. The price has not been increased by the industry, but probably will be as soon as definite disposition has been made of OPA. Barbed wire, likewise, is up for a price increase, it having been requested of OPA before its sudden demise.

Export inquiries for barbed wire have been numerous and in large tonnages during the past month. Manufacturers indicate that they

NEW HOMES FOR OLD: Former residents of the Atomic Isle now dwell in this government housing project on Rongerik Atoll after their move from Bikini.



are not interested in export business because domestic requirements have filled mill schedules throughout the balance of the year. Two notable inquiries that came to the attention of the writer in the past week were: 40,000 tons for export to Argentina and 20,000 tons for Venezuela.

**Galvanized sheets** are probably the tightest item on mill books from a supply standpoint. While order books are not open for next year's business, observers indicate that there is enough business hunting a producer to fill the industry's schedules for all of 1947. There is increased talk in the industry on the question of the extra on galvanized based on the zinc price level, which, if effected now, would boost galvanized sheet prices about \$10 a ton.

Cold-finished bar mill schedules, depending upon size, are filled from September through the middle of the first quarter of 1947. Backlogs are pretty well cleared up, and production is on a more current basis than for most steel products. Sizes that are open for early delivery are those running toward the larger sizes, somewhere in the range of 2 to 4.5 in. On the smaller sizes, automotive, household appliance, hardware, machinery and other such manufacturers are taking all that cold drawers and finishers can turn out and wanting more.

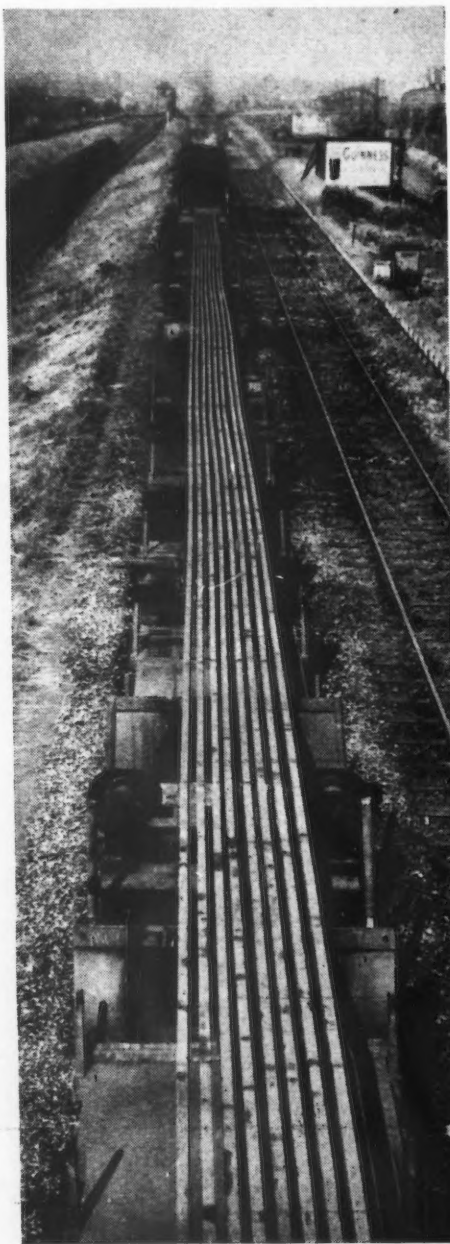
Oil country pipe delivery promises are now running into the second quarter and farther, depending upon the item and the producer. Casing and tubing is in steady demand from oil companies, but these commodities are being used just about as fast as they are received. Observers point out that very little in the way of inventories are building up.

**Line pipe** is in very heavy demand, with the three producers, Jones & Laughlin, National Tube, and Youngstown Sheet & Tube, booked pretty well through the entire year of 1947. About 10,000 tons of line pipe business are being turned down daily at present, and on one peak day a producer turned down 65,000 tons in one day. Welded pipe for pipe lines is dependent upon plate supply, but nevertheless the demand is heavy and still increasing. The recent order received by A. O. Smith for a 1200 mile pipe line involving about 200,000 tons of steel, while

outstanding in itself, is indicative of the heavy demand for pipe.

Standard and merchant pipe mills are now booking first quarter business, with all orders in for the fourth quarter. Production of this type of pipe has been surprisingly heavy, but the demand is still far ahead of supply. There are no noticeable stocks accumulating in warehouses of industrial or plumbing and heating jobbers, which together handle the distribution into

**NO JOLTS:** These 300-ft long welded rails will be used by the British Great Western Railway to extend one of its lines. Welding of long sections diminishes the jolting of passengers caused by the fish plate section joints. This same practice is used by many lines in the United States.



retail channels of about 95 pct of the standard pipe.

Plant repairs are known to be consuming huge quantities of pipe, and housing is likewise taking a heavy cut of the production. Currently, house construction is taking steel, copper or wrought iron pipe, depending only upon what can be obtained when needed. Despite the fact that there is and will continue to be a critical housing shortage, it is the opinion of many that the house building program is moving ahead at a very great rate and few people realize just how many homes are now in the process of construction.

On the whole, steel is and will continue to be a critical item—regardless of the product. However, manufacturers and fabricators have indicated that since the middle of June their receipts have been far more regular and are coming in increasingly better volume than at any time since the end of the war. As many point out, regularity of shipments is desirable since it affords the plant the opportunity to schedule its production on an even flow.

### Big Inch Line Bids Active

Washington

••• As of July 18, War Assets Administration had received seven proposals to purchase and three to lease the Big and Big Little Inch pipelines.

In addition, WAA has also received at least 12 letters of intent or consideration, several of which specify that a bid or proposal will be submitted before the deadline. All proposals will be opened and read publicly on July 31.

Built as a part of the war effort in order to speed delivery of oil to the East Coast area, the lines extend from Texas to the New York-Philadelphia area. The cost to the government was \$79,107,044.26 for the big inch and \$68,563,239.69 for the big little inch.

It is said that four of the prospective buyers who have already submitted bids had expressed the intention of using the lines in whole or in part as oil carriers; two were considering utilizing them for the transmission of natural gas; and the seventh contemplated removal and relocation of at least one of the two lines as an oil carrier.

## New Base Period for Revisions in Prices Seen Important in OPA Revival

### Washington

• • • For metal lines the outstanding change made in the resurrected OPA bill, which it is assumed though not assured at this time will reach the White House and be signed by the President, relates to the fixing of 1940 as the base period for price revisions. Under the old law, 1936-1939 was the base period. While the change will require a great deal of calculation regarding costs and profits, it was stated at OPA that it already has considerable 1940 data and that revisions would often not prove to be especially difficult.

Whatever the changed system may bring about in price regulation, it is taken as a foregone conclusion that the steel industry soon through its Industry Advisory Committee will present to OPA as required by the new act comprehensive data based on 1940 costs for higher prices.

It is expected that the showing to be made by the industry will result in granting of higher prices. Reports are that they would have been forthcoming in the near future had OPA been continued in its original form. It has 60 days to act after petitions for price increases have been presented. Whether steel price increases contemplated are to be across-the-board or are to be confined to specific lines on which losses are reported is not known. Included in the latter group are such products as rails, hotrolled bars, concrete bars and some flat-rolled tonnage.

Pig iron price increases are said to have been determined upon by OPA shortly before the old act expired on June 30. It is expected that with the resurrection of OPA, it soon will announce these increases, said to be \$2 a ton. Where pig iron prices were increased more than \$2 a ton during the period of the suspended OPA, they will undoubtedly be ordered rolled back to the old level.

Producers, of course, can petition OPA for restoration of above ceiling prices and, if accompanied by what OPA considers cost data to justify them, will be granted boosts above the ceiling. OPA recently took such action in approving a \$4

a ton increase in price for Republic's Gadsen, Ala. furnace.

The new section of OPA setting up a Decontrol Board probably will have no bearing in iron and steel lines since there is no present prospect that supply will catch up with demand during the 1-yr period extension of the Control Act.

## CPA Plans to Resurrect Wartime Salvage Groups To Fulfill Scrap Needs

### Washington

• • • Following up the OWMR scrap program, designed to move scrap now in the hands of government agencies (THE IRON AGE, July 18, p. 104), CPA has announced an iron and steel scrap salvage drive aimed at industrial channels. While all of industry will be covered in the CPA pro-

gram, the initial and major effort will be concentrated on the five best sources of scrap—railroads, the petroleum industry, mines, public utilities and the automotive industry.

Edward W. Greb, former Deputy Chief of the Industrial Salvage Branch of WPB's Salvage Div., has been loaned to CPA by the city of Lake Worth, Fla., where he serves as director of utilities, to head up the drive. He is being assisted by L. D. Green, American Iron & Steel Institute, representing scrap consumers, and Edwin C. Barringer, Institute of Scrap Iron & Steel, representing scrap producers.

CPA also expects to enlist the services of most of the 860 industrial leaders who participated in wartime salvage programs. These key industrialists will be asked to form active executive committees which will blanket all industrial areas. The agency will appeal directly to the former chairmen of the wartime committees and will also try to enlist the support of the NAM and the country's business papers.

Through these committees each industry will be requested to perform the following six actions immediately:

- (1) Appoint an executive with authority to make decisions on scrap collection.
- (2) Organize a salvage committee in every plant.
- (3) Survey all plants and properties for untapped sources of scrap.
- (4) Arrange to dispose immediately of all free and unquestionable items as scrap.
- (5) Prepare a list of all idle and obsolete equipment, machines and parts.
- (6) Study all questionable, idle and obsolete items for future disposition.

CPA entertains high hopes that a large proportion of the current 300,000 ton monthly scrap requirement during the next six months will be met by this emergency program. Battlefield scrap is coming back at a rate approximating 20,000 tons a month, but this is only a drop in the bucket. A shortage of labor for gathering battlefield scrap, caused by regulations prohibiting the use of servicemen for this purpose, is the major bottleneck.

## General Gregory Speaks Plainly

### Washington

• • • "It's a damned-if-you-do-or-don't proposition," Lt. Gen. Edmund B. Gregory, retiring War Assets Administrator said here. Because of ill health, the wartime Quartermaster General is turning over to Lt. Gen. Robert M. Littlejohn the job of surplus disposal which he has held since the turn of the year. During the 6-month period, General Gregory revamped procedures and policies and saw a tripling of the monthly rate of sales from \$303 million in January to \$809 million in June (figures are original cost) as well as a 382 pct increased sales to veterans.

"The WAA has made substantial progress despite every conceivable obstacle and insistent false attacks from misinformed individuals," he added. "Too many look upon surplus as a gigantic department store from which Uncle Sam dispenses gifts and bonuses. . . . Special interests have exerted and continue to exert pressure to open the floodgates of surpluses for their own purposes. . . . Others seek to lock up surpluses which may compete with their own interests—despite existence of legitimate demand, if not critical need."

## Canadian Steel Strike Drastically Reduces Ingot Operating Rate

Toronto

• • • As a result of the strike at the three basic steel mills, Canada's iron and steel production has been reduced to less than 35 pct of rated capacity. This condition offers a serious threat to Canada's basic economy in view of the fact that hundreds of industrial operations and hundreds of thousands of workers may be seriously affected. While there is still some iron and steel production under way, that coming from the Steel Co. of Canada will have to be stockpiled as it can not be moved from the plant while the strike is in progress. Other plants such as Dominion Foundries and Steel at Hamilton and Atlas Steel Co., Welland, are maintaining operations with their electric furnace units and shipments from these sources are reported.

From a total of 14 blast furnaces in Canada, only 3 stacks now are blowing, one at the Steel Co. of Canada's plant and 2 small furnaces at the Canadian Furnace Co., Port Colborne. The latter company's total rated blast furnace capacity is 221,760 net tons a year and its output is merchant iron for foundry use. Merchant pig iron melters are now depending on these two small stacks for their supply and it is pointed out that current pig iron production by this company is less than 10 pct of actual requirements.

Toronto

• • • Strikes at the plants of the three big basic steel producers in Canada, Steel Co. of Canada, Hamilton, Algoma Steel Corp., Sault Ste. Marie, and Dominion Steel & Coal Co., Sydney, N. S., have resulted in almost total suspension of iron and steel shipments in this country. While Algoma Steel Corp. and Dominion Steel have suspended all steelmaking operations, the Steel Co. of Canada continues to produce with a staff of some 2000 workers operating on two shifts a day.

While the Steel Co. of Canada is maintaining production it is unable to make shipments of its various steel materials because it cannot pass the picket lines to get its shipments out. Subsidiary plants of the Steel Co. continue in opera-

tion at various points in Ontario and Quebec, but it is doubtful that these will be able to continue as they are fabricating units and depend on the main plant for steel.

Owing to the serious shortage of steel that has prevailed in Canada over the past several years it was impossible for the company to build up large reserve stocks to provide for such an emergency as that which developed with the strike.

Not only has the steel strike affected some 14,000 workers in the steel plants concerned, but it threatens to shut down hundreds of other plants in Canada that depend on domestic steel mills for supplies and eventually may affect hundreds of thousands of our workers.

## Canadian Government Delays Action to Hike Domestic Metal Prices

Toronto

• • • Despite application to Ottawa for an increase in Canadian base metal prices no action has yet been taken by the government to bring the domestic prices to a level comparable with those prevailing in the export markets. This fact together with the return of the Canadian dollar to parity will mean a heavy loss to Canadian base metal producers in the future. It is estimated that domestic copper sales this year will total 80,000 tons as compared with 37,000 tons as the annual average prewar rate. It is pointed out that the increase is abnormal because legitimate manufacturing business in Canada has not advanced at anything like this scale. It is stated there is considerable speculative buying in copper, lead and zinc by fabricators who are stockpiling against the time when domestic prices do increase. It also is reported that some speculators have been buying for export.

As a result of the big increase in domestic speculative buying Canadian base metal producers, especially copper mines, are unable to meet their commitments in the export markets, especially in the United Kingdom. Canadian production of copper is down from the prewar level and it is estimated that output of refined copper this year will total approximately 164,000 tons compared with 240,000

While there has been considerable discussion of the steel strike in the House of Commons, and severe penalties have been provided for strikers who go out against government-controlled industry no direct action has yet been taken by the government to bring an end to the dispute.

According to word from Ottawa it is unlikely that the government will make use of the extraordinary powers given to the Controller of steel plants to penalize strikers and those inciting a strike. However, it has been agreed that the House of Commons standing committee on industrial relations be immediately convened to seek information on the causes and the issues of the strike.

tons in an average prewar year. Thus producers will have only about 85,000 tons of copper to meet old customer demands in the export market against upwards of 200,000 tons yearly before the war.

## Coke Supplies Dip To New Low Point

Chicago

• • • Curtailment of bituminous coal shipments to byproducts coke plants have reduced the supply of coking coal to the lowest level since May, 1936. Authorities believe it will be several months before the available coke supply is anywhere near demand.

Statistics on coke production released through mineral industry surveys of United States Bureau of Mines, reveal that on June 1 this year, the monthly output of byproduct coke had declined 33.2 pct when compared with April figures. The daily average of byproduct coke had dipped 35.4 pct in 30 days. Production of beehive coke, which is not a large factor in today's production, showed a daily average recession of 21.8 pct over the same period. Production of coke took a drastic drop in May with the exception of that made from several beehive coke plants that continued operations on a reduced scale.

The demand for coke, however, was heavy during this period and stocks on hand at the end of the month at producers plants showed a 25 pct decrease from the previous month.

# Weekly Gallup Polls . . .

## Republican Party Gains Added Strength

Princeton, N. J.

• • • If a presidential election race were being held today, the Republican Party would have a definite edge over the Democratic Party in the New England and the Middle Atlantic states, according to George Gallup, director, American Institute of Public Opinion.

A trend away from the Democrats has been in progress there in recent months.

Although the Democrats carried 10 out of the 12 states in the two areas in 1944 (Maine and Vermont went Republican), at present the GOP is favored by the majority of voters polled in each of the two regions.

The poll shows Democratic strength down 8.5 points in New England as compared to the 1944 election, and down seven points in the Middle Atlantic area.

The situation in the two areas today is shown in results of an institute poll on the following question—a question which has proved a reliable index during the last decade as a measure of party strength:

"If a presidential election were being held today, which party would you vote for—the Democratic or the Republican?"

Following is the vote for New England and the Middle Atlantic states.

### NEW ENGLAND

(Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut)

	1944	
	Today	Election
	Pct	Pct
Democratic	44	52½
Republican	56	47½

### MIDDLE ATLANTIC STATES

(New York, New Jersey, Penna., Delaware, Maryland, West Virginia)

	1944	
	Today	Election
	Pct	Pct
Democratic	45	52
Republican	55	48

This poll can reflect only the present day sentiments of the people in the two areas, subject to the changes that may be brought about by happenings at home and abroad, by the nomination of the

candidates and by the presidential campaign itself.

Nevertheless, the gravity of the situation for the Democratic Party can be seen by looking at the figures for previous years in New England and the Middle Atlantic states.

The Democratic lead in other years, while comfortable, was never overwhelming even at the height of Mr. Roosevelt's popularity. The party's percentage never, with the exception of 1936, ran more than four points above the 50-50 line in either of the two sections. The development of an adverse trend, therefore, would seem to be of more than ordinary seriousness to the Democrats since they have enjoyed only a relatively slim margin of lead in the past.

The trend expressed in terms of Democratic percentages was:

	Democratic Vote	
	New England	Middle Atlantic
	Pct	Pct
1932 Election	50	53
1936 Election	54	60
1940 Election	53	52
1944 Election	52½	52
Today	44	45

As for individual states in the sections, all but one of the ten carried by the Democrats were carried by less than 55 pct in 1944.

The New England and Middle Atlantic states have a total of 157 electoral votes, or almost one third of the total for the country.

Rather surprisingly, however, in the West Central section, the section which went more heavily Republican in the last election than any other, the present trend in presidential party strength is not so marked as in the other sections so far reported. The West Central section is composed of Minnesota, Wisconsin, North Dakota, South Dakota, Kansas, Nebraska, Iowa and Missouri.

In this section Republicans have picked up four points as compared to the 1944 election. Republican strength in the area is found now at 56 pct, as compared to 52 pct in 1944.

## Poll Conducted in Central And Eastern States Shows Shift To Republican Party Candidates

• • •

In the East Central area—Illinois, Indiana, Michigan and Ohio—the Republicans have picked up six additional points in strength as compared to 1944. Here, too, the Republicans register 56 pct of the vote today. The vote in this section was almost evenly split between Republicans and Democrats in the last presidential election, with each party carrying two of the four states.

As reported earlier this week, in New England and the Middle Atlantic regions, the trend away from the Democratic Party is even more marked. Democratic Party strength in New England has dropped 8½ points as compared to 1944; in the Middle Atlantic region the drop has been seven points. In 1944 the Democratic Party was the dominant party in both sections, but today the Republicans are the majority party judging by the poll results.

Thus, the tides appear to be running heavily in favor of the Republican Party in all four sections so far covered in the present survey series on presidential party strength.

### EAST CENTRAL AREA

(Ohio, Indiana, Michigan and Illinois)

	1944	
	TODAY	Election
	Pct	Pct
Democratic	44	50
Republican	56	50

### WEST CENTRAL AREA

(Wisconsin, Minnesota, North Dakota, South Dakota, Kansas, Nebraska, Missouri and Iowa)

	1944	
	TODAY	Election
	Pct	Pct
Democratic	44	48
Republican	56	52

The trend in the Midwest has been markedly away from the Democratic Party since 1936. The

[CONTINUED ON PAGE 151]

## J & L Takes Legal Action in Attempt To Rescind Recent UMW Foremen's Contract

Washington

• • • The validity of an agreement between the Federal Coal Mines Administrator and the United Mineworkers covering 136 foremen and supervisors of four government seized mines of the Jones & Laughlin Steel Corp., Pittsburgh, will be given the first test soon in the U. S. Court of Appeals for the District of Columbia.

The steel company on July 17 filed a petition in the court to restrain the Coal Mines Administrator from making an agreement that would set up the union as collective bargaining agent for company mines. Hardly had the petition been filed when Admiral Ben Moreell, Federal Coal Mines Administrator, announced the signing of three agreements with the United Clerical, Technical and Supervisory Employees Union, district 50, UMW. They covered wages and working conditions of supervisory employees at the J&L mines, J&L clerical and technical employees and the clerical and technical employees of the Industrial Collieries Corp., a Bethlehem Steel Co. subsidiary.

The agreement covering mine foremen and supervisors at the J&L mines is the first of the kind ever made and marked a big victory for UMW president John L. Lewis. It was about a year ago in a J&L proceeding that for the first time the National Labor Relations Board certified mine foremen and supervisors as a collective bargaining agent. Employers generally have strongly challenged the authority of NLRB to make foremen and supervisors collective bargaining agents. It has been contended that foremen and supervisors are representatives of management and therefore cannot be unionized. The outcome of the present case promises to have a far reaching effect since it has a bearing on all industries.

Government-union agreements cover the period of government operation of bituminous coal mines and were signed pursuant to the provisions of the agreement signed on May 29 by Secretary of the Interior and Mr. Lewis. The latter agreement with its concessions in

wages and working conditions marked the settlement of the soft coal strike.

So far, however, only the foremen and supervisors in J&L mines have been covered by collective bargaining agreements. It is realized that after the coal mines are turned back to private owners the union will insist that the agreements be applied to all mines and undoubtedly to other industrial operations.

J&L's latest petition for an injunction was filed after a similar petition was denied on June 25 by the District of Columbia Federal District Court. Denial was made on the basis of the government's agreement that the steel company could in no manner question or interfere with any action of the Coal Administrator since the government had all the rights of a proprietor.

Sharply challenging this sweeping claim, attorneys John C. Bane, Jr., John J. Wilson, John C. Gall and H. Parker Sharp, company counsel, contended in a brief that the government did not assume all property rights in seizing properties during the recent coal strike.

The brief quoted from a paragraph in "Regulations for Operations of Mines" which governs the Coal Administrator, reads as follows:

"All properties in the possession of the government shall be operated in a manner consistent with the fact that title to the properties remains in the owners thereof and that the government, having temporarily taken possession or custody, will assert only such rights as are necessary to accomplish the national purpose of continued and maximum production."

In the face of this provision, however, Harry I. Rand, Dept. of Justice Attorney, argued in the district court that there is no law of which he has knowledge which gives to private management whose property has been seized, "the right to appear in connection with any application for a change in terms and conditions of employment and to challenge either the right of the government to make

application or the right of the union to make the application or the propriety or wisdom of the application made."

The agreement covering J&L supervisory employees provides for an increase of \$1.85 for each full working day and an increase of \$25 in vacation pay. Clerical and technical employees of J&L and Industrial Collieries were granted the check off, a \$25 increase in vacation pay, an 18½¢ hr wage increase, and overtime pay after 40 hr. The wage increases are retroactive to May 22.

In accordance with NLRB procedure the union will file upon notice from the Coal Mines Administrator, a charge of refusal by J&L to bargain. This will be done as a means of giving the company an opportunity to obtain a final judicial determination of the rights of the supervisors of its mines under the Wagner Act.

## Alcoa Plans to Build New Die Casting Plant

Pittsburgh

• • • The Aluminum Co. of America announced that it had purchased property at Des Plaines, Ill., for construction of a new plant for the manufacture of aluminum die castings. Application has been made to the Civilian Production Administration for permission to build, but the company would not indicate the cost of the project.

The new plant, when completed, will have about 190,000 sq ft of floor space, and will employ between 400 and 500 people when the plant begins operations. Spokesmen said the plant is being built because Alcoa's die casting plant at Garwood, N. J., is overloaded trying to meet the demands for these products.

While the new plant will be larger in floor space than the Garwood plant, officials of the company stated that this would be no indication of the die casting capacity of the plant. They stated that no indication would be made as to the prospective capacity of the new plant. During the war, the Garwood plant was listed as having a capacity of 838,000 lb of die castings a month.

## Mine Operators Fear Permanent Government Occupation of Coal Mines

Pittsburgh.

• • • Leaders in the coal industry are greatly perplexed about their possibilities of regaining control of their coal mining properties. Many do not expect this to occur this year and others openly charge the government's "occupation" is developing into an experiment in nationalization of industry.

Byron H. Canon, executive secretary of the Western Pennsylvania Coal Operators Assn., asserted the administration was "making the coal industry a guinea pig for an experiment in national socialization," in a statement made in connection with the National Labor Relation Board examiner's hearings into petitions for election to select collective bargaining agents for supervisors in five district mines.

Mr. Canon charged the hearings were "prejudged" and the move was an attempt to "establish some semblance of legality" to the experiment in which the administration has prevented the real owners of the mines from getting a judicial review of the supervisory question.

Those who agree with Mr. Canon, claim a new pattern is being made by the occupation. They say the administration quietly twiddled its thumbs while an inevitable national crisis was arising due to the coal strike, then suddenly seized the mines and hurriedly drew up a contract that granted concessions going far beyond those of any previous contract made under similar conditions.

They say that Coal Mines Administrator, Admiral Ben Moreell, and Secretary of the Interior, J. A. Krug, (who was rushed into the scene at the last minute after the Dept. of Labor had been doing the observing), might have been sincere when they promised publicly to give operators full opportunity to negotiate with them before signing the contract. But the facts were that the first meeting at which the operators were shown the agreement was interrupted by a call from the White House for Admiral Moreell to go and sign with John L. Lewis. The operators didn't get to change a comma or dot an "i" in the document.

Many property seizures occurred during and after the war, with the

unions usually being given a large portion of their dollars and cents demands. The stated and generally recognized purposes of a union is to "seek improvement of wages, hours, and working conditions" and war labor agencies confined contract issues to those items.

Only in the Montgomery Ward case was a company forced to accept a certain union as representatives of its workers after government seizure. A federal district court overruled the seizure, the Circuit Court of Appeals reversed this decision, and the Supreme Court vacated the Circuit Court's finding and directed the case be dismissed as moot, on the government's motion, after the property had been returned to the company.

In granting the United Mine Workers the right to collect 5¢ a ton for a welfare fund, totalling about \$25,000,000 a year "as a start," disgruntled operators say the beginning of a new socialization program outside of regular labor contracts was forced upon the

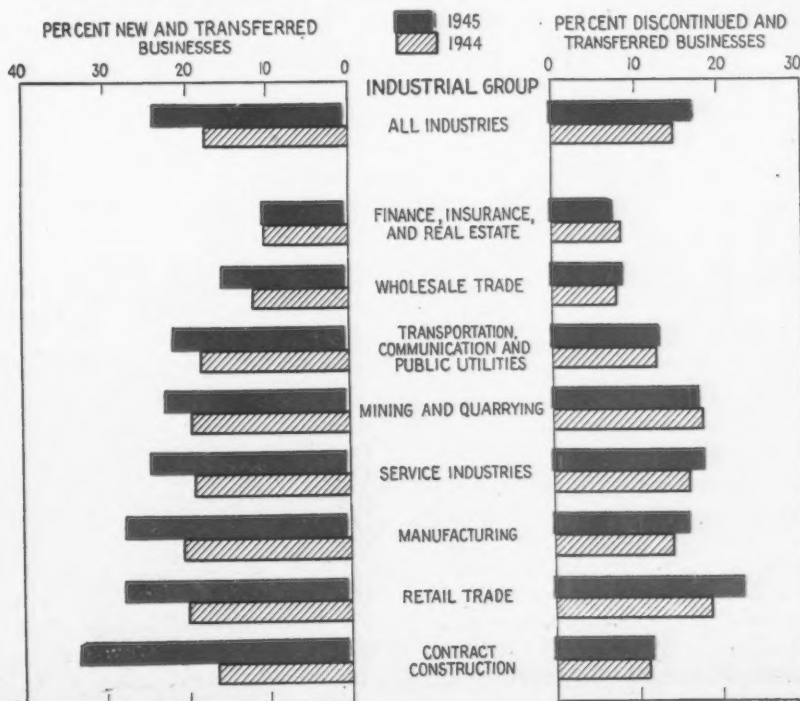
industry. They contend this fund will be operated virtually exclusively by the union, because Mr. Lewis obtained an agreement from Interior Secretary Krug that, in addition to appointing one man on the three-man administration board, Lewis would hold the veto power over the second nominee appointed by Mr. Krug. The first two named to the board will select the third member.

Admiral Moreell stated that he intended to follow the NLRB decision in signing the first contract with the union covering the 135 supervisory employees at four mines of the Jones & Laughlin Steel Corp. Elections already have been held at these mines and an affiliated unit of the United Mine Workers of America certified as the collective bargaining agent.

The NLRB, however, notified Admiral Moreell that a certification itself was not a binding order, but that the operator would have no opportunity for a final judicial review until the union filed a complaint of non-compliance and the company was cited by the Board.

Coal men are genuinely alarmed about the supervisory question,

**VITAL STATISTICS:** Roughly 5 pct of the total number of firms operating at the beginning of 1944 discontinued business during the course of the year, a rate which was duplicated the following year. Business mortality in these 2 yr appears unusually low as compared with prewar rates which were almost double the 1944 and 1945 figures. On the other hand, rates of entry, especially in 1945, were close to prewar levels and represented an addition of 7 and 10 pct, respectively, to the total number of firms in business at the first of each year. (From: U. S. Department of Commerce.)



arguing that in the vast underground workings it is necessary both for efficiency and safety that management have full loyalty of the men who direct workings of the 25 to 75 man crews. They assert that a supervisor, sincere in his oath as a member of UMW, necessarily will have to give second best service to an employer whenever the interests of the two clash.

Jones & Laughlin tried to block the move to get the supervisors into the union recently by an appeal for an injunction in the District of Columbia Federal Court. They argued that the seizure was under the Emergency War Disputes Act, almost a year after all hostilities ceased, and that they would be done irreparable damage.

Harry I. Rand, attorney for the Dept. of Justice, representing both Admiral Moreell and the NLRB, told the court that the government has all the rights of a permanent owner. He declared that "no court could interfere with the Admiral's acts as administrator, even if the administrator might knowingly be exceeding his legal rights."

The only redress that the mine owners have, Rand said, is to plea for some reparation after any damage is done. Justice Jennings Bailey upheld that contention and the company is now appealing to a higher court.

The worried operators say that under this ruling, the federal government now is in position to impose additional costly operating conditions and could create a situation whereby it would be impossible for them ever to be able to regain the mines. That, they add, could mean the taxpayers some day would be faced with a huge bill for the occupation.

## Output of U.S. Freight Cars To Be Retarded By French Car Order

Pittsburgh

• • • With materials starting to move into railroad car builders' plants now for construction beginning in October of the 36,750 20-ton freight cars for the French, domestic car production will sag sharply from Oct. 1 until the end of the first quarter of 1947. It is estimated that some 300,000 tons of steel are involved in the French orders, and, while car builders will maintain domestic car lines, output on the 41,000 domestic cars on order will drop sharply.

Nearly all American car builders have portions of the French order. Pullman-Standard, Butler, Pa., and Bessemer, Ala.; Pressed Steel Car Co., Pittsburgh; Greenville Car, Greenville, Pa.; Magor Car Co., Passaic, N. J.; American Car & Foundry Co., Berwick, Pa., and Madison, Ill.; and General American at East Chicago, Ind., are all participating in this program. About the only manufacturers not represented are Ralston at Columbus, Ohio, Mt. Vernon Div. of Pressed Steel Car Co., at Mt. Vernon, Ill., and possibly one or two others.

Strikes in both suppliers' plants and in car builders' shops have tied up car production this year to the point that backlogs are extremely heavy, some 41,000 cars on July 1. The material supply situation now, however, is not confined to any particular item. As a matter of fact, steel is, by comparison, in fairly good supply, while airbrakes, wheels, lumber, and, in the case of passenger cars, electrical equipment are the main holdups from a

supply standpoint to greater production. As to the shops themselves, apparently production in the shops—shop output—is not all it could be, mainly the result of localized and sometimes petty labor disturbances.

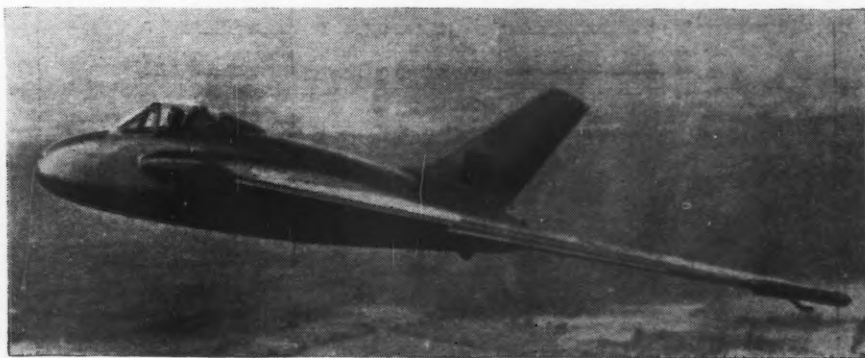
New car business placed can be summed up pretty well with three orders recently placed by the Erie, Louisville & Nashville, and Baltimore & Ohio Railroads. The Erie program consists of 500 50-ton box cars placed at American Car & Foundry Co., Berwick, Pa.; 300 hopper cars, with the Greenville Steel Car Co., Greenville, Pa.; and 200 70-ton gondolas, placed with Bethlehem Steel Co., Johnstown, Pa. That order also included 16 diesel switch engines placed with American Locomotive at Schenectady and four diesel switchers placed with Baldwin Locomotive, Philadelphia.

The L&N program, announced within the past few days, consists of 1250 50-ton hoppers, to be built by Pullman-Standard at Bessemer, Ala., 750 50-ton hoppers, American Car & Foundry Co., Madison, Ill., and 1000 50-ton box cars, placed with Pressed Steel Car Co., Mt. Vernon Div., Mt. Vernon, Ill. The Baltimore & Ohio Railroad recently placed orders for 1000 50-ton hopper cars with Pullman-Standard at Butler, Pa.

As to passenger car business, there is very little in the inquiry stage. Orders for about 2500 passenger cars have been placed and many of these are in the form of passenger trains or units of various type cars. The Westinghouse and other electrical strikes have delayed passenger car production, and several cases of shipping electrical panelboards by automobile to car plants have been reported.

Locomotive builders are believed to be in better shape, productive-wise than car builders, mainly because locomotive business was placed earlier than the bulk of the car business and deliveries are on a far more current basis. Practically any business, locomotive or car, placed now will be for 1947 delivery, so analysts in the industry anticipate a sloughing off of new car inquiries for the next couple of months. As to any early relief of the congested situation in car manufacture, it is estimated that nothing will be very clear before Jan. 1, 1947.

**SWEPTBACK JET:** British sources say this De Havilland 108, or Swallow, is expected to reach a speed of 657 mph. The craft, which has its wings swept back at a 43° angle is a stripped down version of the company's Vampire jet fighter.



## Dollar Parity Seen as Slight Boon to Canadian Steel Purchasers

Toronto

• • • Returning the Canadian dollar to par with the United States dollar was the first step taken by Canada to counteract inflationary prices in the States that might result from dropping of the OPA, and to protect this country from a similar inflationary trend. Some interests consider the return of the dollar to parity is tantamount to a 10 pct tariff reduction, and while it may have the same result, government circles discredit the idea.

The Canadian gold mining industry may be seriously affected by the return of the dollar to par, due to the fact that it will reduce the Canadian price of gold from \$38.50 to \$35 per oz, it also will tend to reduce the price on American purchases of base metals. On the other hand Canadian consumers that make big purchases in the United States will reap a considerable benefit by not having to pay the 10 pct premium when settling U. S. accounts. It is estimated that the saving to Canadian importers will run to hundreds of millions of dollars per year, and eventually some of this saving may be passed along to consumers. However, it may be several months before consumers receive much benefit in the way of price reduction.

At the moment there are no indications that Canada will either abandon or lift price ceilings in effect at this time, despite the fact that labor troubles and strikes are rearing their heads in many industrial companies throughout the Dominion. However, in well informed circles it seems to be the opinion that if all union demands for wage increases are to be met, higher commodity prices may become necessary.

Insofar as the Canadian steel industry is concerned the return of the dollar to par, means a saving of approximately 10 pct on imports from the States. In the case of the Steel Co. of Canada Ltd., which imports most of its iron ore, coal and in some instances semi-finished steel, costs are cut about 10 pct, while Algoma Steel Corp., which imports some iron ore and its coal supply, also exports ore from its

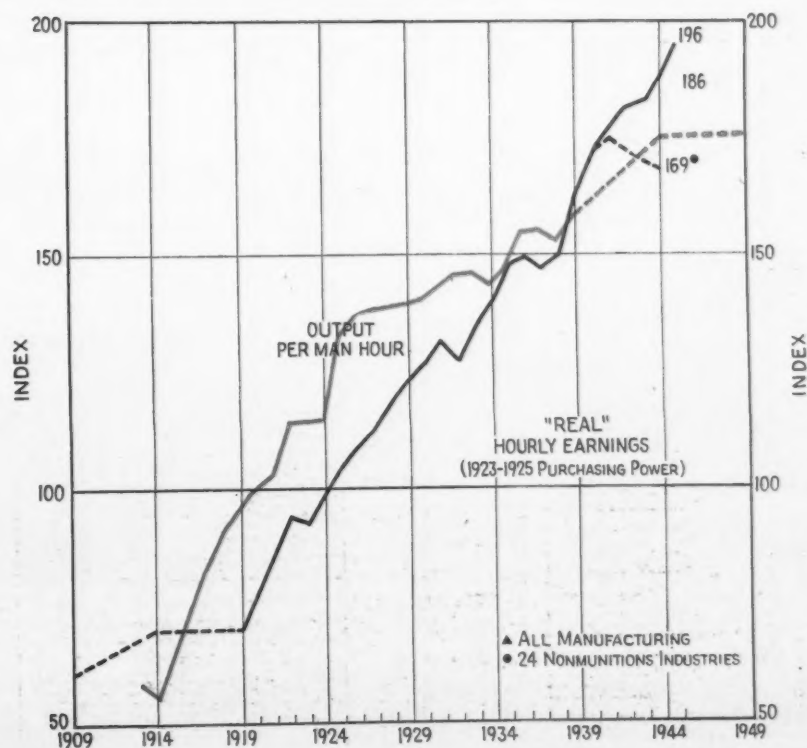
mines in Michipicoten. Thus while it gains on imports it loses on exports. At Dominion Steel & Coal Co., Sydney, N. S., which obtains most of its iron ore from Newfoundland and its coal from Nova Scotia, the change makes little difference insofar as raw materials are concerned.

Canadian steel consumers who depend largely on the United States for supplies will reap full benefit through not having to pay the premium on U. S. funds. Cold-rolled steel sheets are among the principal items of imports due to the fact that this type of sheets is not produced in Canada, although the Steel Co. of Canada is installing a unit for this operation which should be completed before the end of 1947. Imports on other types of steel have been growing in volume and these will enter Canada at lower cost than formerly. On the

other hand there is a possibility of higher prices across the line and in this event importers would have to pay the additional cost, against pegged prices in Canada. While the actual selling prices for various steel materials in the United States are lower than those prevailing in Canada, if we take Pittsburgh as a basing point and add freight and sales tax, the price about equals that in this country. Thus Canadian consumers still are faced with the duty charge.

As conditions now stand with regard to imported laid down steel prices, even with the lifting of the dollar to parity with that of the United States, importers are faced with higher raw material costs than users that depend wholly on domestic sources of supply. On this account there has been a definite swing from imported to domestic steel by many consumers and this condition is expected to expand as the supply situation in Canada improves.

**MAN'S WORLDLY GOODS:** Advances in output of manufactured goods per hour worked have been closely accompanied by increases in the wage earner's ability to buy goods and services. Thus, for every unit of output per manhour in 1909, 2.7 units were produced in the 40's; and for every dollar of real hourly earnings in 1909, American factory workers received 2.7 dollars. At the present time, however, real earnings are outstripping advances in productivity, a phenomenon that also occurred after World War I. [From: National Industrial Conference Board.]



## Market Readjustments Based on Freight Increases Seen as Premature

By D. I. BROWN  
Chicago Regional Editor

### Chicago

••• Recent increases in interstate freight rates within official territories including border points, have not been identically followed by all the individual states, in the percent of intrastate raises.

Most states in the eastern area of the Northern Territory have, in most cases, adopted the full grant making the same basic exceptions as appeared in the original ruling of the ICC. New York State is one exception where no action has been taken as yet.

Midwestern states are lined up pretty well with a 6-pct intrastate rate increase. Effective July 21, Illinois increased its intrastate rates 6 pct. Indiana, Michigan, Iowa, Wisconsin, Missouri, Kansas, Nebraska, and South Dakota have all gone along with that figure. Minnesota has taken no action. Michigan, which originally adopted 6 pct, has been requested to grant a hearing wherein the carriers will ask for the additional 5 pct. If granted, the total percent increase in Michigan would equal the ICC interstate raise of 11.3 pct. Arizona, Colorado, and California have all granted the 6 pct raise.

The entire case of rates is at

present being heard by the ICC in Chicago. Plaintiffs, which include all the major roads in the country, are presenting their cases hoping to convince the commissioners that the 11.3 pct is not enough, and that the 25-pct increase originally requested is needed. The final decision may not be made before next year and the present emergency rates will be in effect until the commission can reach a suitable decision.

Adjustments in market areas, by shippers, solely to take advantage of a favorable freight rate which might be confined to one state, would be unwise and premature. If the market area is at all otherwise attractive, withdrawing from unfavorable areas or states is not justified, at present, on intrastate freight rates alone.

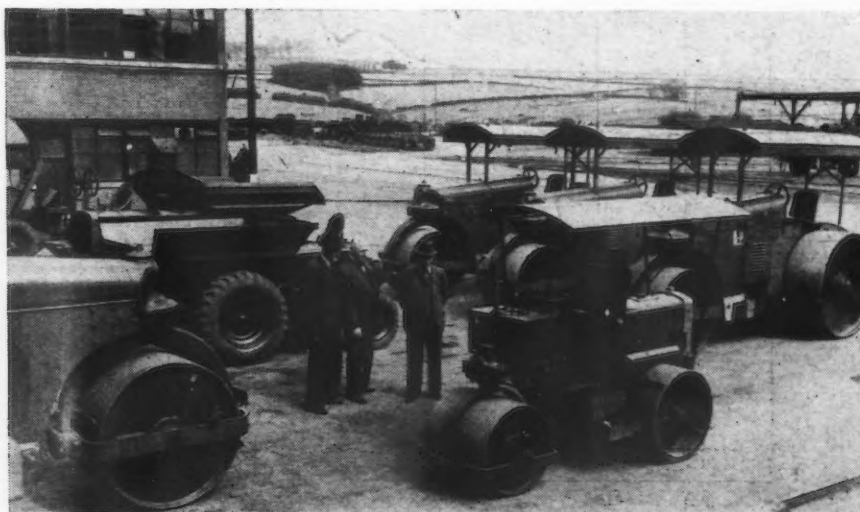
Exact nature of the final ruling to be given by ICC after the hearing, cannot possibly be predicted. Upon receiving the verdict of ICC all the state commissions will be forced to reopen hearings on intrastate movements, and not until those decisions have been made can the shippers make any long range plans on the economies involved in the freight rate structure.

Viewing the extended effects of the increased cost in hauling materials by rail generally, is another story. Steel producing units near the center of their normal consuming market aren't in the bad shape as are those who have long hauls and may be shipping into basing points. This situation has in some cases discouraged, and will continue to discourage, more sellers from market areas heretofore serviced. Present demand for all products and the scarcity of many raw materials secured from old established sources has precluded a rush exodus by the steel industry from unprofitable market districts. Heavy industry, such as the steel and iron producers, cannot pack up their plants and move to a favorable locality regardless of how much they would like to do so. One alternative is, in the construction of new mills, to choose the site for production as close as possible to the plants in which the products are to be used. Another course, which has been followed to some extent, has been to discontinue to supply high cost areas. As business gets back closer to normal, many more such changes in selling policies can be expected.

Shifting to water transportation has not been feasible by all producers. In erecting new producing units the industry will certainly choose water locations if the high cost of rail transportation continues to exist. The very narrow margin of profit on many of the products made by the industry necessitates slashes in cost if operations are to be maintained. Reductions in the cost of operations usually follow the easiest channels. Relocation of manufacturing sites, although far from the easiest channel, may well prove to be the most economical and therefore the most logical conclusion.

The present picture is too beclouded to be interpreted and those who are adversely affected by higher freight rates have long since been laying plans to remedy their position. However, any advantage to be had by selecting markets favorable only because of the present temporary difference of intrastate rates are minute, as the entire rail distributing system of all industries is at stake and hinges on the result of the ICC hearing now in session.

**BRITAIN ROLLS:** *Plugging hard for export markets British makers of road construction machinery have been hitting a high rate of salesmanship in order to get machinery out and on its way. Here are samples of the Aveling-Barford plant of Grantham, England.*



## Britain Will Use Credit to Buy Equipment Necessary for Rehabilitation

Washington.

• • • A portion of the recently approved \$3,750,000,000 loan to Great Britain will be utilized for purchasing "considerable amounts of heavy machinery" to aid in the rehabilitation of British industry, it has been revealed by Treasury Secretary John W. Snyder.

This information was given in connection with Secretary Snyder's announcement that the first installment of the loan, amounting to \$300 million, would be placed to the credit of the British Government with the Federal Reserve Bank of New York on July 18.

While there was no indication as to the amount to be used for this purpose or the specific types of machinery to be procured, Snyder said that he understood that most of it would be of the kinds of which there are no shortages in this country.

A check of British agencies here showed an equal dearth of specific information. A committee in the British capital is now working on allocation of the fund for various requirements. No definite an-

nouncements are expected under two weeks.

Buying with the new credits will originate in London. The British Ministry of Supply (formerly the British Purchasing Mission during wartime) no longer has procurement authority. Its chief function now is to liquidate itself.

Mr. Snyder saw no inflationary threat to either Britain or the United States in the loan.

"I have no definite information as to when or how they will draw it out," he said. "They are studying the program and will advise us from time to time what it is. The present indication is that they are going to be very cautious about the withdrawal."

At his press meeting, Mr. Snyder said that he knew of no basis for the rumors that the British would revalue their currency. British interests here are said to be dissatisfied with the current \$4.03 exchange rate because of rising prices in this country, but Treasury officials believe the loan will ease considerably the pressure for revaluation.

Under the terms of the loan, Britain has agreed to relax its currency exchange restrictions, including normal of curbs under which American exporters usually must accept payment only in pounds sterling. No working date for this action had been set, however, at the time of the announcement.

### British Workers Fewer

London

• • • Ministry of Labor figures for May show a further monthly fall of 100,000 in Britain's total working population, and an increase of 287,000 in the numbers engaged on civilian manufactures and exports.

At the end of May the total working population was 20,321,000, against 20,421,000 last April, 21,569,000 in mid-1945, and 19,750,000 in mid 1939.

### Correction

New York

• • • A regrettable error was made in THE IRON AGE July 18, 1946, p. 111-C when it was reported that Woodward Iron Co. had raised the price of pig iron \$3 a ton. The company has not raised pig iron prices but another southern iron company did advance its price.

### SUMMARY OF UNITED KINGDOM STEEL STATISTICS

Source: British Iron & Steel Federation

All Figures Thousands of Net Tons	STEEL			PIG IRON	SCRAP	IRON ORE	
	Ingot and Castings	Finished Deliveries	Steel Stock (1)	Production (2)	Steelmaking Consumption	Imported Ore Consumption	Home Production
1944 Total .....	13599.0	11502.4	2431.5	7542.0	8252.6	2725.6	17332.2
1945 Total .....	13237.8	9992.3	1885.9	7959.4	8065.9	4494.7	15870.4
1945 May .....	1180.4	924.0	1630.4	717.9	724.0	343.8	1626.8
June .....	1067.5	835.0	1566.9	595.8	680.5	307.7	1289.3
July .....	956.9	695.3	1475.4	603.9	597.1	347.2	1228.8
August .....	1041.0	796.8	1434.4	701.1	619.3	436.2	1239.2
September .....	1077.8	792.5	1415.4	624.9	650.0	438.1	1102.5
October .....	1360.8	932.4	1356.8	818.1	818.1	595.2	1385.4
November .....	1106.1	803.7	1358.0	672.0	659.9	467.7	1115.5
December .....	992.3	735.6	1332.4	651.8	592.7	449.7	1036.6
1946 January .....	1025.0	971.0	1370.9	803.6	754.8*	541.5	1373.6
February .....	1107.5	833.2*	1341.5*	654.5	657.2*	445.8	1147.3
March .....	1145.5	898.6	1314.7	659.9	695.2	484.2	1148.6
April .....	1129.4	827.0	1265.1*	666.1	682.7*	505.7	1090.8
May .....	1466.0	1139.0	1285.6	846.7	885.9	644.5	1371.4

<sup>1</sup> Held by producers and in British Iron & Steel Corp. stockyards at the beginning of the years and months shown.

<sup>2</sup> All qualities, including ferroalloys.

\* Revised.

## Portsmouth Steel Price Relief Granted by OPA Before Inactivation

### New York

• • • Action to grant price relief to the Portsmouth Steel Corp., Portsmouth, Ohio, recently acquired Kaiser-Frazer steel mill facility formerly owned by the Wheeling Steel Corp. was taken before the temporary inactivation of OPA. It has been learned that a memorandum had been prepared granting Pittsburgh prices for hot and cold-rolled carbon steel sheets f.o.b. Steubenville, Ohio on which the Portsmouth Steel Corp. has paid Wheeling Steel Corp. a conversion charge for sheets destined for the Kaiser-Frazer Corp. or the Graham Paige Motors Corp.

Sales of carbon steel rerolling slabs to Wheeling Steel Corp. are being made at \$42.78 per gross ton, f.o.b. Portsmouth, Ohio. Carbon steel rerolling ingots are to be sold at \$36.78 f.o.b. Portsmouth.

In the case of silicon sheet bars

sold to the Wheeling Steel Corp., the maximum base price is as follows:

Grade	FOB Portsmouth
Field .....	\$46.00
Armature .....	48.00
Electrical .....	53.00
Motor Special .....	55.50
Motor .....	58.00
Dynamo .....	60.50
Transformer .....	63.00
Transformer, special .....	65.50

In the case of all other sales, the maximum base price is the Pittsburgh basing point base price for the product being sold. These prices are base prices subject to adjustment by all applicable standard extras and deductions except that all sales are to be net cash, without cash discounts.

In analyzing the basis for the price exception the order states, it is understood, that the Portsmouth plant is primarily intended for the production of semifinished steel and has few facilities for convert-

ing such steel into finished products. Profit must come, therefore, from the sale of the historically lower profit items of semifinished steel products. Because of the lack of conversion facilities adjusted prices were requested.

The Wheeling Steel Corp., previous owner of this plant, had, prior to the war, shipped their production of semifinished steel to other plants for conversion into more profitable finished steel products and only on rare occasions produced semifinished for sale. However, during the war, the WPB directed Wheeling Steel Corp. to sell large tonnages of their Portsmouth production in the semifinished state.

Based on this directed production, Wheeling Steel Corp. applied to OPA and received differential ceiling prices. This relief was granted based on costs and Wheeling's overall financial position, which latter data reflected Wheeling's more profitable finishing operations.

## June Ore Consumption Mirrors Iron Output

### Cleveland

• • • Iron ore consumption by U. S. and Canadian blast furnaces increased materially in June, reflecting the steel industry's return to high operating rates following settlement of the coal strike.

U. S. and Canadian blast furnaces depending principally on Lake Superior district iron consumed 4,994,936 gross tons in June as compared with 2,990,189 tons in May, and 6,397,091 tons a year ago, according to the June report of the Lake Superior Iron Ore Assn.

June consumption of 4,994,936 gross tons brings the aggregate for 1946 to 24,242,288 tons as compared with 40,346,303 for the corresponding period of 1945.

The association's report showed 26,264,914 gross tons of ore on hand at furnaces and Lake Erie docks as compared with 23,904,998 tons on June 1, and 24,847,472 tons on hand July 1, 1945. Active furnaces totaled 156, according to the report, 150 U. S. and six Canadian, compared with 76 in the U. S. and six in Canada a month ago. A year ago 162 were active in the U. S. and 7 in Canada. Idle furnaces totaled 39, as compared with 113 on June 1.

### Coming Events

- Sept. 10-14 American Chemical Society, exposition, Chicago.
- Sept. 11-12 Society of Automotive Engineers, national tractor meeting, Milwaukee.
- Sept. 16-20 Instrument Society of America, first conference and exhibit, Pittsburgh.
- Oct. 1-4 Iron & Steel Exposition, Cleveland Public Auditorium, Cleveland.
- Oct. 3-5 National Electronic Conference, Chicago.
- Oct. 3-5 Society of Automotive Engineers, aeronautic meeting and display, Los Angeles.
- Oct. 9-11 Porcelain Enamel Institute, University of Illinois.
- Oct. 10-12 American Society Tool Engineers, semi-annual convention, Pittsburgh.
- Oct. 28-30 American Gear Manufacturers Assn., semi-annual meeting, Chicago.
- Oct. 29-Nov. 1. Refrigerator Equipment Manufacturers Assn., exposition, Cleveland.
- Nov. 7-8 National Founders Assn., New York.
- Nov. 17-22 American Welding Society, annual meeting, Atlantic City, N. J.
- Nov. 18-22 National Metal Congress and Exposition, Atlantic City, N. J.
- Dec. 2-4 Society of Automotive Engineers, air transport meeting, Chicago.
- Dec. 2-7. National Power Show, New York.

# The London **ECONOMIST**

## End of Price Control

THE United States has started on the second half of 1946 without price control, while Congress struggles to recover from the shock of an unexpected veto. In refusing to sign H.R. 6042, the bill providing for a 1-yr extension of price control, in the form in which it reached his desk, President Truman emphasized that the choice afforded him was between inflation with a statute and inflation without one." The day before the veto, Chester Bowles, Economic Stabilizer, had resigned in protest against the "booby trap" amendments attached to the bill by Senators Taft (R., Ohio) and Wherry (R., Neb.), Representative Crawford (R., Mich.) and others in line with the program of the National Association of Manufacturers and numerous other business and farming groups. So on June 30th the OPA Act lapsed.

Periodic waves of "Save OPA" letters have swept over Congressional desks this spring. One rose in April. Another is breaking now. Between waves, or perhaps even during them, the majority of Congressmen have been disposed to listen to the NAM's argument that to soften or, better still, to eliminate price control would induce tremendously increased output, and that after a brief preliminary interval the competition forced by this output would bring prices into line. Farmers, to whom Congress is equally attentive, have been similarly hostile to restrictions; the New York Times recently reported that observance of price control in rural midwest areas in June was on a level with the observance of Prohibition during the late 1920's and early 1930's.

The full-page advertisements published by the NAM on July 3 and entitled "The Future with Confidence," prophesied that "as production gets rolling again supply will catch up with demand . . . prices will be fair and reasonable to all . . . quality will be improved

. . . black markets will disappear . . . and America will enter the period of prosperity that everyone has been hoping for."

THOSE who are skeptical of this rosy future advance a double basis for their doubts. Their denunciation of legislated inflation, as proposed, for instance, under the Taft amendment, is based on a belief that the delays accompanying the calculation and granting of price increases would lead to hoarding. (The lengths to which hoarding in anticipation of price rises can go were dramatized on the Eastern seaboard during June by the almost complete absence of meat from all legitimate markets.) And since one legal price increase would almost always lead to another, one man's price being another man's cost, it is suggested that the extent of hoarding might be limited only by the amount of storage space available.

Much more of the argument on the merits of permitting free play of the market while a variety of goods are still in short supply hinges on the new position of labor unions in the economy. In previous periods of rising prices, wages rates have tended to lag behind prices enough to act as an eventual brake, slowing the response of consumer purchasing power to further price rises. But the recently exhibited strength of organized labor makes it predictable that any substantial price rise now would call forth immediate demands for corresponding wage increases. If these demands were resisted, slowdowns in production would result, with corresponding increases in the inflationary pressure due to shortages. If they were quickly met by employers confident of a market at any price, another spiral would be under way. The desire and ability of many labor unions to synchronize wage and cost-of-living changes were brought to public notice by Chester Bowles some

*Reprinted by special permission to further understanding on how political and economic affairs are viewed in London.*

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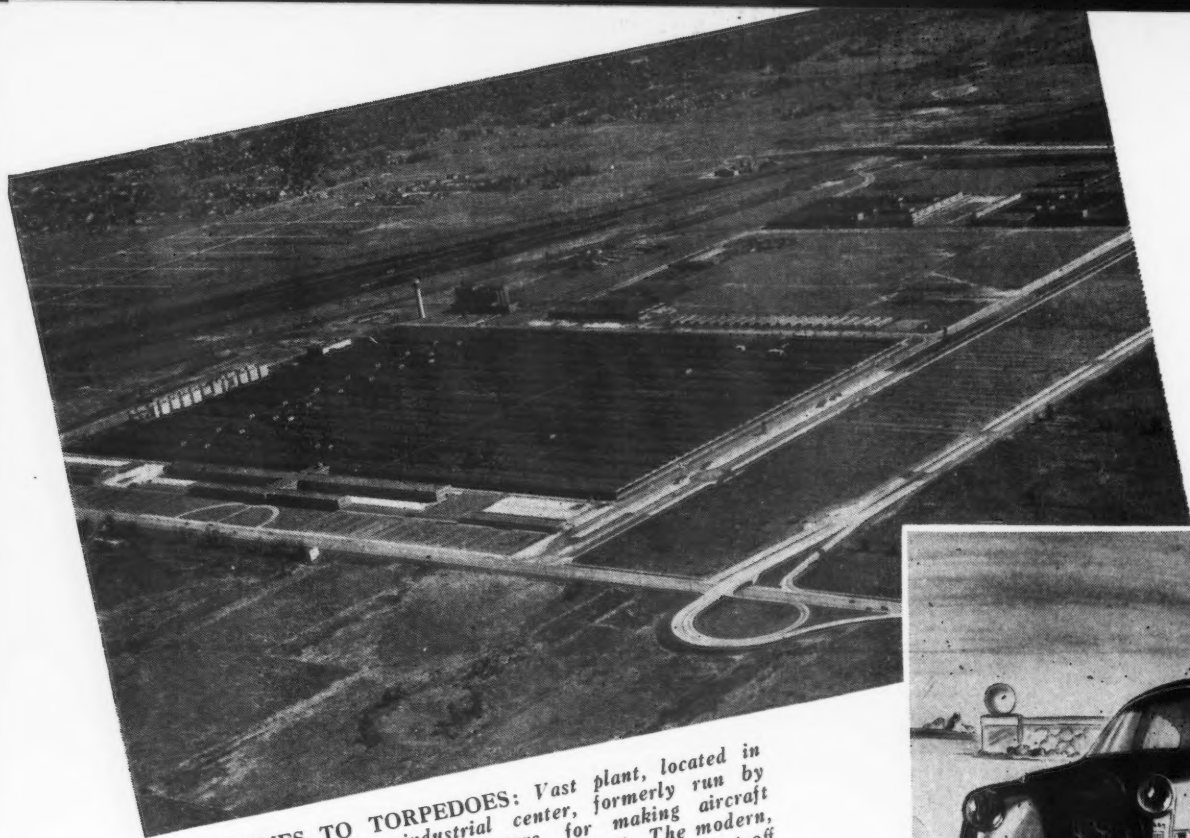
time ago; it is rumored that before his resignation Mr. Bowles had obtained from Mr. Murray and Mr. Green (the respective heads of the CIO and AFL) a 1 yr no-strike pledge conditional upon the maintenance of effective price control.

Even the most vigorous supporters of the OPA hold no brief for continuing price control beyond the period of shortages. Many administration leaders believe that one more year of effective control would see the country through. Hence their exasperation that the present crisis should come when a fluctuating civilian economy was so nearly in view.

Previous impressions of the extent of pent-up consumer purchasing power should perhaps be revised. A recent study by the Federal Reserve Board of Governors, "A National Survey of Liquid Assets," concluded that 60 pct of all liquid assets (demand deposits, time deposits and U. S. Government bonds) held by consumers are held by the top 10 pct of the spending units (classified according to income) and that 87 pct of the liquid assets are held by the top 30 pct of the spending units. In other words, the extraordinary volume of savings accumulated during the war and held in liquid form is not as widely distributed among the various income levels as had commonly been supposed.

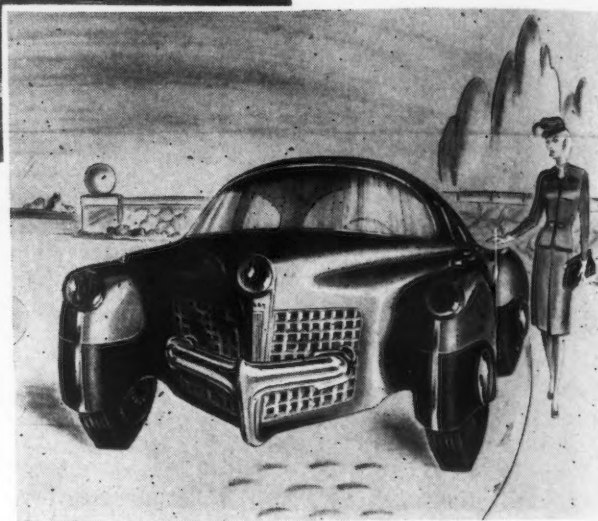
THE study also reported consumers' intentions with respect to their liquid savings: as of the first quarter of the year, only \$5 billion to \$6.7 billion of a total variously estimated at \$81 billion

[CONTINUED ON PAGE 152]



**B-29 ENGINES TO TORPEDOES:** Vast plant, located in Chicago's southwest industrial center, formerly run by Dodge division, Chrysler Motors, for making aircraft engines, has been taken over by Tucker Corp. The modern, rear engine, six passenger torpedo automobile will start off the lines early next year.

**SWEET AND LOW:** Artist's conception of Tucker's Torpedo designed for sustained cruising speed of 100 mph with ample safety. Large luggage space front and back, doors open so that passengers get up rather than out.



## Tucker Corp. Plans Output of Its New Car in 8 to 10 Months

### Chicago

• • • The world's largest manufacturing plant under one roof, which was leased by War Assets Administration to the Tucker Corp., will start production of the medium-priced Tucker Torpedo automobile within 8 to 10 months, said Preston Tucker, 43-yr-old president of the latest entry in the automotive field. Design features of the revolutionary car incorporate many totally new, and many tried and tested features from the automotive and aviation field.

Mr. Tucker has gathered a staff of topnotch automotive men and during his first press conference, which was held at the former Dodge-Chrysler B-29 engine factory, he stated emphatically, "We are going in the automobile business big and for keeps." He announced that a \$20 million public issue through an investment house would be disclosed within 6 to 8 weeks.

Covering 475 acres, comprising the most modern buildings and ma-

chines available, and costing \$180 million, the new Tucker facilities will be rapidly converted for car production as soon as government inventories are settled. Tucker's 5-yr lease amounts to \$600,000 rental for the first year, with an option to buy all land, buildings and machinery for about \$60 million. William J. O'Neill, former president of Dodge Div., Chrysler Corp., laid out the original plant with future auto production possibilities in mind, and he is now with Tucker as consultant to the management.

The Torpedo weighs two thirds as much as other models, is wider than it is high, and is powered by 150 "full grown horses," with 250 lb engine weight. Mr. Tucker pointed out that safety dominated their thinking in planning the Torpedo.

A forward sloping hood permits full vision through a curved safety glass shield. Fenders and lights, except the center Cyclops fixed beam, turn with the wheels. This,

according to the company, enables the driver to see where he is going quicker and with greater safety at a cruising speed of 100 mph than was formerly possible at much slower speed.

Brakes will be of the aircraft disk nature with area four times greater than the present drum type, which, Mr. Tucker says, will stop the Torpedo from 90 mph in 240 ft. These features, along with welded tubular steel frames, direct hydraulic power transmittal from engine to wheels, doors, which extend into the roof, swing out and then up at a 45° angle and a 24-volt electrical system with separate fuses for each light, are some of the other innovations of the car which make it truly new.

Some of the Torpedo features have been known for some time but have not been engineered into cars because of the high cost involved in changing over design. The 126 in. wheelbase six-passenger Torpedo is to be built without such complicated mechanisms as clutch,

transmission, differential, and drive shaft and the usual rear axle. A savings of 800 lb is achieved by eliminating approximately 800 of the parts now found in the conventional car. Tucker was noncommittal of the exact price of the car because of present market conditions.

The six cylinder, horizontally opposed engines, will be built at the plant. Forty pct of the 8000 machine tools and 35,000 general all purpose machines are in standby readiness and can be used as is. Other equipment will be redesigned, sold or leased. A one piece cast aluminum block and head with bronze cylinder liners having the same coefficient of expansion as the aluminum piston will be used.

Power will be transmitted to the back wheels through two fluid fly-wheel converters connected to torque shaft by universal joints. Placing the engine in the rear eliminates the annoyance of engine noise and odors. More floor space and less vibration has been achieved by not having a drive shaft.

The Tucker engine is fundamentally a refinement of a speedway engine. Through precise compression ratios, and proper alignment of valves, plus the machined cylinder dome and matching piston head contour a smooth, straight fire line piston stroke will be had with no tendency for spark knock.

Body design calls for A-frame members of welded tubular steel and B-frames of aluminum. The choice of the two metals are determined according to strength and weight requirements of the various members. Most of the body work is to be farmed out. Mr. Tucker declined to reveal his sources but said "two of the leading body companies in the country." Industrial circles believe that Briggs Mfg. and Murray Corp. were implied. Component body parts will be shipped in, knocked down, and will be assembled here. The front cowl and deck are to be made from aluminum sheets. Steel is to be used for fenders and in all deep drawing applications. Steel top, and side panels of aluminum are other items of interest.

Mr. Tucker stated that vendors of steel, aluminum and rubber have been contacted and two sources on all items have been secured with adequate shipment promised for

early next year. Approximately \$14½ million will be needed for all expenses, including construction of the assembly line, to reach the 300 car a day output. One hundred sixty-seven cars a day is figured as the break-even point, with the eventual goal of 1500 units per day being reached shortly after tooling is completed.

Associated with Mr. Tucker in top management of the organization, are H. A. Brown, vice-president and assistant to the president, former vice-president of General Motors of Canada, Ltd.; Fred Rockelman, vice-president and director of sales, former president

of the Plymouth Div., Chrysler Corp.; Robert Pierce, vice-president and treasurer, former secretary, treasurer and director of the Briggs Mfg. Co.; Herbert Morley, director of purchases, former manager of all Detroit plants, Borg-Warner Corp.; and Robert Jack, chief engineer, formerly chief engineer, Oldsmobile division of General Motors.

Hiring of factory personnel will not start for 30 to 60 days. Sixty-five experts are being brought in from the Detroit area. Top production will require 35,000 employees in the Chicago area, it was estimated.

## CPA Adds Additional Products to List Of Inventory Controls

Washington

• • • Effective at once, CPA has announced that an additional 18 finished products have been added to the list of items for which manufacturers' inventories must be limited to either 30 days' production or a practicable minimum working inventory, whichever is less. All such inventories must be in compliance by not later than Aug. 15.

The newly restricted items are:

Asphalt and tarred roofing products  
Bedding products (metal beds, inner-spring mattresses, felt mattresses, box springs, coil, flat, and fabric springs, dual sleeping equipment)  
Building board (board made from wood pulp, vegetable fibres, pressed paper stock, or multiple plies of fibred stock). The limitations apply to the total amount in the manufacturers' inventory rather than item by item.  
Furniture, wood and metal  
Galvanized ware  
Gypsum board  
Gypsum lath  
Laundry equipment, domestic  
Mechanical refrigerators, domestic  
Metal windows  
Metal plastering base (metal lath)  
Miscellaneous electrical appliances  
Photographic equipment  
Pipe: Soil, cast iron  
Screen cloth, insect  
Ranges, electric  
Sewing machines, domestic  
Vacuum cleaners, domestic

At the same time, 27 items formerly listed as exempt from inventory controls under table 3, PR 32, were ordered under the practicable working inventory provisions of the regulation. These items are:

Abrasive products—made from manufactured or natural abrasives  
Bearing—ball and roller  
Bending machines for pipe, plate, roll, or structural shapes  
Capital equipment (other than that elsewhere listed on this table and other than wood poles, cross arms, domestic watt hour meters, power

and distribution transformers, circuit breakers and switch gear)  
Chains, except stud link anchor, cast steel, power transmission  
Cranes and hoists  
Files and rasps  
Forging machines  
Foundry machinery, equipment and supplies  
Furnaces, metal melting  
Gages, and precision measuring tools  
Heat treating equipment, metal  
Jigs, dies and fixtures  
Machine tools, non-portable power driven  
Machine tool and metal working attachments and accessories  
Mechanics hand service tools  
Metal cutting tools  
Metal working machines and tools, portable power-driven  
Metal working presses, hydraulic and mechanical  
Pipe fittings (not bell, spigot, compression, flared or Parker type)  
Piping accessories: Industrial, marine  
Rolling mill stands and attached equipment  
Shears, punches and nibblers, power-driven  
Valve handwheels  
Valves, goggle  
Valves, piping system (not airbrake equipment, aircraft instrument, refrigeration, or plumbing fixture fittings and trim)  
Wire drawing machinery

Still a third change in the regulation adds five products to table 1, which lists the specific number of days' inventory permitted on individual items. These products are:

Building board, 30 days; butyl acetate and butyl alcohol (normal), 45 days; cast iron soil pipe, 30 days; metal plastering base, 30 days; and insect screen cloth, 30 days.

The listing of zinc, already on table 1, has been widened to cover all metallic zinc, including zinc die-cast alloy, 30 days.

In making the announcement of the changes, CPA emphasized that the regulation applies to all consumers buying for either use or resale, including those persons purchasing for export only. Only ultimate consumers who buy for personal or household use are excluded.

## Industrial Briefs...

• **CHART AVAILABLE**—The Do-All Co. of Des Plaines, Ill., has made available a chart entitled "History of the Machine Age" explaining how machine tools formed the link that made mass production possible and laid the foundation for the industrial economy. The purpose of this educational chart is to assist the rank and file worker to understand their mass production system.

• **REPRESENTS STEEL FIRMS**—E. Stewart Riggs, formerly with J. F. Corlett & Co., has opened offices in Cleveland to represent Alan Wood Steel Co., Champion Rivet Co., Franklin Steel Works and Phoenix Iron Co.

• **PURCHASES SITE**—Canadian General Electric Co. has purchased a 35-acre site at London, Ontario, for construction of a new plant as soon as building materials are available. The proposed plant, to employ 900 workers, will manufacture major electrical appliances.

• **FOUNDRY SOLD**—International Harvester Co., Chicago, has purchased the malleable iron foundry of the General Malleable Corp., Waukesha, Wis., government owned, and is negotiating for the purchase of the equipment in the plant.

• **PULLING OUT**—Inland Steel Co. has announced the closing of its Cincinnati office, effective Aug. 15. Several northwestern counties of the state, formerly handled by this office, will be transferred to the company's Detroit office. The remainder of the territory, including Cincinnati, Dayton and Columbus, will be transferred to the company's Indianapolis office. L. W. Schellhammer, who has been a member of the staff of the Cincinnati office, will become a resident salesman in Cincinnati, operating out of the company's Indianapolis force.

• **ADDED TO STAFF**—Recent additions to the staff of Arthur D. Little, Inc., Cambridge, Mass., industrial research organization, include Daniel R. Weedon, Jr., packaging specialist; Dr. Colin C. Reid, organic chemist; Dr. George P. Fulton, biologist; and Garvin Bawden, Jr., market analyst.

• **BUILDS NEW PLANT**—The Westinghouse Electric Corp. has started construction of a new plant, warehouse and office building on an 8-acre site in the geographical center of St. Louis. The two buildings will cover approximately 135,000 sq ft of floor space, compared to 75,000 sq ft at the present location and in outside warehouses.

• **ESTABLISHES FIRM**—L. S. Baier, formerly chief engineer and production manager of Gunderson Bros. Engineering Co. at Portland, Ore., has established his own organization as L. S. Baier & Associates, marine designers and engineers, at 542 Mead Bldg., Portland 4.

• **PLANS EXPANSION**—Plans are discussed for the \$2 million expansion program now under way at the National Magnesium Corp. of Elkton, Md., and New York. The plans call for the development of commercial applications of magnesium powders and fabrication of extruded shapes and tubes from magnesium alloys.

• **NEW DEPOTS**—International Harvester Co. plans to install a system of 13 zone parts depots throughout this country and Canada. The new distribution system will provide faster, more efficient handling of service parts for both dealers and branches. Depots are to be stocked with inventories of about 60,000 part items, including all but the slowest moving of the company's lines.

## ODT Plan Would Lease Box Cars to Carriers

Washington

• • • Being discussed with the Assn. of American Railroads is a plan projected by ODT Director J. Monroe Johnson for government purchase of 50,000 new box cars which would be leased to the carriers and placed in service by January. The proposal is similar to the old PWA program. It has not been taken up with the individual railroads.

It has been suggested by Colonel Johnson because of what he says is the pressing need of the railroads for new cars in addition to those which are now on order. Under the proposal purchase would be made by RFC and the cars leased to the railroads with the obligation that they purchase the equipment at its depreciated value before buying other cars of the same kind. To assure the government against financial loss, payments would cover its costs of ownership including allowances for depreciation and a fair return on the investment.

## Military Releases Nails

Washington

• • • The critically short nail supply will be eased slightly within 30 days by the release of 6000 tons of Army and Navy nails but this will have only a negligible effect on the amount available to the hardware dealer or general consumer. The entire 12 million lb will be channelled into the Wyatt emergency housing program.

Approximately 3000 tons represent military surplus and in view of the current civilian shortage the War and Navy Depts. have agreed to release an equal amount which had been held in reserve stocks. The entire amount will be sold through regional offices of WAA.

Since about 400 lb of nails are required for the average six-room house, the windfall would normally represent the equivalent requirement for 30,000 houses. However, a large portion will go into the completion of temporary housing for veterans at colleges and the remainder will be used to meet demands of HH priority holders.

## Construction Steel...

### Chicago

••• Contractors badly in need of concrete bar are substituting small merchant bars including alloy and miscellaneous steel shapes in concrete construction. One contractor in the Michigan area has purchased long mill lengths of carbon bars and has arranged with the fabricator to unload, cut to length and reload for \$10 a ton. The standard fabricating steel bending charges were added.

### Washington

••• A contract for a welded steel work barge has been awarded to the American Bridge Co., Denver, on its low bid of \$63,866, Commissioner of Reclamation Michael W. Straus has announced. The barge, 120 ft long with a 50-ft beam, will be added to the equipment at Grand Coulee Dam on the Columbia basin reclamation project.

### New York

••• Fabricated steel awards this week included the following:

- 3700 Tons, Milan, Ill., highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.
- 2450 Tons, Fort Peck, Mont., risers and tanks, U. S. Engineers, to Chicago Bridge & Iron Co.
- 1700 Tons, Chicago, office building for Illinois Bell Telephone Co., to American Bridge Co., Pittsburgh.
- 1300 Tons, Coram, Calif., drum gates, U. S. Bureau of Reclamation, to American Bridge Co., Pittsburgh.
- 1100 Tons, Hopkins, Minn., manufacturing plant, Superior Separating Co., to American Bridge Co., Pittsburgh.
- 1000 Tons, Pensacola, Fla., paper mill to Virginia Bridge Co., Roanoke, Va.
- 600 Tons, Philadelphia, laboratory and office building for Smith, Kline & French, to Bethlehem Steel Co., Bethlehem, Pa.
- 568 Tons, Long Beach, Calif., transit shed, Pier A, Berth 5, to National Iron Works.
- 537 Tons, Lansing, Iowa, power station, Interstate Power Co., to Vierling Steel Works.
- 500 Tons, Sheldon Junction, Vt., state bridge to American Bridge Co., Pittsburgh.
- 500 Tons, Elkton, Md., extrusion building for National Gypsum Co., to Belmont Iron Works.
- 500 Tons, Clearfield County, Pa., highway bridge for Pennsylvania Dept. of Highways, to American Bridge Co., Pittsburgh.
- 460 Tons, Philadelphia, Inquire Building to Phoenix Bridge Co., Phoenixville, Pa.
- 415 Tons, Louise, Ariz., fixed wheel gates, Davis Dam, U. S. Bureau of Reclamation, to American Bridge Co., Pittsburgh.
- 350 Tons, Boston, hanger for Northeast Air Lines, Inc., to American Bridge Co., Pittsburgh.
- 270 Tons, Tilton, N. H., manufacturing building for Johns Mansville Co., to Bethlehem Steel Co., Bethlehem, Pa.
- 180 Tons, Burnham, Pa., building for Standard Steel Works, to American Bridge Co., Pittsburgh.
- 150 Tons, Philadelphia, catapult facility for Navy Yard through Kauffman Co., to American Bridge Co., Pittsburgh.

••• Fabricated steel inquiries this week included the following:

- 4000 Tons, State of Maine, 40 state bridges, previously reported 600 tons.
- 700 Tons, Gary, Ind., blast furnace construction, Carnegie-Illinois Steel Corp.
- 600 Tons, Joplin, Mo., plant, Junge Cracker Co.
- 600 Tons, Cicero, Ill., manufacturing building, Edison General Electric Co.
- 530 Tons, Pasadena, Tex., mill extension, Ebasco Service Co.
- 486 Tons, Nash, Utah, plate steel siphon, penstock, and discharge pipes, Bureau of Reclamation, Denver, Spec. 1363.
- 400 Tons, Harvey, Ill., refining building, Sinclair Refining Co.
- 300 Tons, Pomona, Calif., addition to building, Frenstrom paper mill, Southwestern Engineering Co., general contractor.
- 280 Tons, Springfield, Pa., building for Piasecki Helicopter Co.
- 250 Tons, Jenkintown, Pa., building for Standard Pressed Steel Co., bids in.
- 250 Tons, Snyder County, Pa., girder bridge for Reading Co., due July 22.
- 248 Tons, Columbia Falls, Mont., steel warehouse, Hungry Horse Dam, Bureau of Reclamation, Denver, Spec. 1249.
- 206 Tons, Cambria County, Pa., highway bridge for Pennsylvania Dept. of Highways, due July 26.
- 190 Tons, Fryeburg, Me., state bridge.
- 152 Tons, San Diego, Calif., Grossmont Tunnel, El Monte pipeline, steel tunnel supports, City Clerk, San Diego, bids open Aug. 6.
- 136 Tons, Bonneville, Wyo., steel warehouse, Boysen Government Camp, Bureau of Reclamation, Denver, Spec. 1248.
- 120 Tons, Cambria County, Pa., highway bridge for Pennsylvania Dept. of Highways, due Aug. 9.

## C-I's Dr. Bain Wins Sauveur 1946 Award

### Cleveland

••• Dr. Edgar C. Bain, vice-president in charge of metallurgy and research of Carnegie-Illinois Steel Corp., has been awarded the Albert Sauveur Achievement Award for 1946, which was made on the basis of the recipient's conception of a new approach to the heat treatment of steel, by the American Society for Metals.

Purpose of the Sauveur Award is to recognize a metallurgical achievement which has stimulated other organized work along similar lines to such an extent that a marked basic advance has been made in metallurgical knowledge, according to the ASM announcement.

"Dr. Bain conceived the idea that the mechanism of heat treatment might become known if each step in the cooling was investigated, examining the product formed at each temperature level during cooling. This concept was not so simple as it may seem, for it involved the additional realization, until then unknown, that at each temperature level the transformation occupied time . . ."

- 120 Tons, Harrisburg, Pa., show room and service building for State Equipment Co.
- 100 Tons, Pasadena, Calif., new central office building, Southern California Telephone Co.
- 100 Tons, Astoria, Ore., span over S. P. & S. R.R., Tongue Point Naval Station, Spec. 17786.

••• Reinforcing bar awards this week included the following:

- 164 Tons, King Co., Wash., P.S.H. crossing over Great Northern R.R. tracks, through Neukirch Bros. to Northwest Steel Rolling Mills.
- 150 Tons, Wilmington, Calif., Second Unit, Harbor Steam Plant, Spec. 9414, through Guy F. Atkinson Co. to Blue Diamond Corp., Los Angeles.

••• Reinforcing bar inquiries this week included the following:

- 2250 Tons, State of Maine, Kittery to Portland, highway, bridges, underpasses, etc.
- 2145 Tons, Clovis, Calif., miscellaneous bars, Bureau of Reclamation, Denver, Inv. A-48,784-A.
- 1250 Tons, Quincy, Mass., Nut Island sewerage treatment project.
- 650 Tons, Lane County, Ore., main spillway, Dorena Dam, U. S. Engineer Office, Portland, bids open Sat. 3 (tentative date).
- 342 tons, Casper Wyo., miscellaneous bars, Bureau of Reclamation, Denver, Inv. 19,509-A, bids open July 26.
- 303 Tons, San Diego Calif., Grossmont Tunnel, El Monte pipeline, City Clerk, San Diego, Bids open Aug. 6.
- 134 Tons, Tucumcari, N. M., Hudson Canal structures, Bureau of Reclamation, Tucumcari, N. M., bids open Aug. 29.
- 115 Tons, Marion County, Ore., highway bridges, North Santiam Highway, Public Roads Administration, Portland (re-advertisement), bids open Aug. 1.

Award of the scroll and plaque will be made on Nov. 21 at the American Society for Metal's annual banquet, held as part of the National Metal Congress and Exposition at Atlantic City, N. J.

## Columbia Places Order

### San Francisco

••• Columbia Steel Co., U. S. Steel subsidiary, has placed orders for equipment for its new \$25 million cold reduction steel sheet and tinplate mill at Pittsburg, Calif., and construction is on schedule.

Of the 27 million lb of machinery already ordered, included are: One 56-in., five-stand, four-high cold reduction mill; two two-stand tinplate tempering mills; one single-stand sheet tempering mill; two continuous electrolytic cleaning lines; three tinplate shearing lines; a tinplate side trimming and reshaping line; tinplate and sheet coil annealing equipment; sheet shearing and processing equipment for sheet and drum stock; continuous pickling lines; 14 hot-dip tinning units; one continuous electrolytic tinning line and auxiliary equipment; a sheet galvanizing line, and 21 utility cranes.

# MACHINE TOOLS

... News and Market Activities

## Industry Faces Casting Shortages

• • • Machine tool production, already suffering from a sporadically acute shortage of electric motors, is faced with a new menace in the Civilian Production Administration's action to accelerate delivery of iron castings needed for the Veterans' Housing Program and special farm machinery products.

While CPA's move applies to August and September production only, castings have been in short supply in some segments of the machine tool industry for 6 months or longer, and although the full requirements of CPA are not yet known, some machine tool builders have already been told by their suppliers that the situation may be very critical.

According to qualified observers, the machine tool industry may have, on the average, a 2 or 3 months' supply of castings, and dislocations and curtailment of production would not show up immediately in the majority of cases. However, if CPA's needs for the two programs are high, about Oct. 1 the machine tool industry will start to feel the effect. Some builders may feel it much sooner, but according to one CPA official, the pig iron shortage, an aftermath of OPA, will be over by September.

With predictions that the domestic market for machine tools is slated to pall, in the opinion of some observers, exports and foreign markets are receiving increased attention, privately and publicly.

Recently, Charles Simmons, of the Simmons Machine Co., Albany, returned from a trip to Europe, during which he visited Switzerland, France, Holland, Belgium and Great Britain, sounding out machine tool export prospects.

While it had been the impression of the industry here that foreign builders' prices would undercut domestic prices by about 40 pct, Mr. Simmons found that everywhere machine tool prices were comparable to ours, except in Switzerland, where they averaged about 10 pct higher. Swiss tools, according to Simmons, who has also surveyed China and South

America, are precision instruments, comparable to our own, but tools made in other countries were not comparable to the products of the United States industry.

Delivery promises abroad on new tools range from 2 to 3 yr due to lack of materials and the general hardships of reconstruction, which is an encouraging note for builders in the United States who have been scanning the possibilities abroad and who can give much quicker delivery.

Mr. Simmons feels that the outlook for exports of U. S. machine tools appears good for some time to come, as foreign buyers are eager to get our machines. However, the problem of payment is paramount. France, out of the recent French-U. S. agreement, has earmarked \$38 million for U. S. machine tools, but according to reports, orders have not yet been placed due to the red tape involved.

All this is to the good, if the Chinese and other foreigners buying used machine tools in this country recognize the fact that many of the used machines, both in WAA surplus and in private hands, are pretty well worn out. In this regard, the recommendation has been made that all companies rebuilding tools for foreign customers place a plate on the machine showing the name of the rebuilder and the date the job was done.

In Boston and the East, those reporting a slight pick-up in July sales a week ago say that things have eased off again, but bookings for the month to date are still ahead of those for the corresponding period of June. Plant shutdowns for vacations and pending offerings of surplus equipment at a Rhode Island plant have brought the market almost to a standstill.

July has been a good month from the start for some builders in the Cleveland area, with entries well ahead of last month. Inquiries are still coming in, and a good general improvement in new orders is expected within the next 30 days. Electrical equipment shortages are hampering some builders, and a

shortage of castings looms as almost an immediate problem for one producer.

In the surplus, not many lathes are available, particularly engine and tool room types, but sales through the Cleveland Regional WAA office are moving much more smoothly than in the spring and early summer, with the sale at the Quigley warehouse the focal point of interest.

In Cincinnati, there has been some decline in machine tool production during the current month as the result of vacation periods. Some plants have terminated night shifts and others have closed down for brief periods.

## WAA May Change Rule On Machine Tool Extras

Washington

• • • War Assets Administration is considering revision of its disposal regulations in order to permit more flexibility in the Clayton formula covering the sale of attachments on standard machine tools, it was learned this week. As it stands now, the purchaser must buy all the attachments, whether he can use them or not, in order to acquire the machine.

At the same time, WAA is also studying two recommendations made at the latest meeting of the Metalworking Machinery and Equipment Advisory Committee.

One is that surplus machine tools be rebuilt before they are placed in the export market in order that high standards of American-made equipment may be maintained; the other, that tools in long supply be placed in the nominal price category in order to assist schools with limited budgets in bringing their machine shops up-to-date.

It was further reported to the committee that a majority of the government-owned machine tools now had either been declared surplus or were in WAA warehouses. Total sales now have passed the \$233 million mark of which approved-dealer sales account for \$82 million, according to latest statistics.



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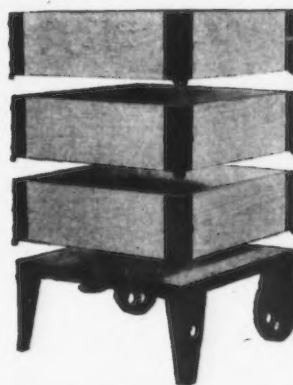
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# NONFERROUS METALS

... News and Market Activities

## All Copper Stockpile Offered for Housing

Washington

••• CPA stands ready to order or lease of the government's entire stockpile of copper, if necessary during the next 90 days, in order to prevent a slowdown in emergency housing construction through lack of such copper and brass products as water pipe, flashings, guttering, weather stripping, lighting fixtures and similar items.

Agency officials have told the brass mill Industry Advisory Committee that such products must be provided for the program even if other orders had to be relegated to later delivery. While trying to avoid institution of a preference system similar to the order certification of steel, CPA indicated that some spot assistance might be provided in case of undue delays.

Production of domestic refined copper amounted to only 202,000 tons for the first half of 1946 and imports of 128,000 tons brought the total supply to 330,000 tons. Consumption for the period was 532,000 tons, resulting in a withdrawal of 200,000 tons from the stocks held by the Office of Metals Reserve.

Demand for the last half of 1946 is estimated by CPA at around 600,000 to 660,000 tons against an estimated 345,000 ton supply, indicating a further drain of 255,000 tons or more on the reserve stocks.

This would leave in the stockpile 45,000 tons or less as compared with the 500,000 on Jan. 1 and 300,000 as of July 1.

June brass mill production rose to 200 million lb, according to CPA figures, largest peacetime production in history. Despite

this vastly increased output, CPA said, all of it will be absorbed by new housing demands now materializing.

## Tin

New York

••• It is reported that active dealers in tin are sticking to the established ceiling prices during the current lapse in OPA control. During this period the Office of Metals Reserve is reported to be holding back on allocations of tin for export pending OPA's revival. Nor has the Department of Commerce Office of International Trade been granting tin export licenses during the month. By these mechanisms the government is assuring the prevention of tin exports at above export ceiling prices.

## Zinc

New York

••• With a large government stockpile of zinc, most consumers are continuing to have difficulty in meeting their requirements of the grades in greatest demand, Prime Western and Special High Grade. The stockpile is made up largely of production during the war under which producers wherever possible took advantage of the price differential between Prime Western and Brass Special and upgraded their product for the  $\frac{1}{4}\%$  higher price.

Die casters must have Special High Grade but there was no price spread between High Grade, normally consumed by the brass mills for some of their high purity products, and the Special High Grade so that most mills asked for delivery of the highest purity zinc. With increased peacetime produc-

tion of zinc base die castings the current shortage of this product is felt badly.

In an effort to relieve the shortage of some grades of zinc, CPA has extended the 30-day inventory limitation to all grades. Producers expect that this development may afford some temporary easing of the problem inasmuch as some consumers have put in a large tonnage to hedge against the possibility of a price rise.

Price control has not been applied to imported zinc where no processing of the product is carried on in this country and the zinc is sold abroad. Custom smelters have long sought the right to sell at world zinc prices and while the OPA had been giving consideration to the possibility, nothing developed from the appeal.

## Lead

New York

••• Consumers of lead are receiving only a portion of their needs despite the month-old government effort to scale down requirements by limiting distribution to the most urgently essential applications.

Producers have been ordered by CPA to distribute only 75 pct of their August production, reserving 25 pct for allocation by that agency.

## Copper

New York

••• Producers continue to withhold shipments of copper from their own stocks pending clarification of the status of OPA, meanwhile the fabricators are selling brass, wire and other products made from copper from the Metals Reserve stockpile.

While the mines and refineries are back in production after the recent strikes, it takes quite some time for the blister copper to be put through the refining cycle before it comes out as a saleable product. Therefore while no sales are being made from producers' stocks, their inventories are not building up as rapidly as might be expected.

### Nonferrous Metals Prices

Cents per lb.

	July 17	July 18	July 19	July 20	July 22	July 23
Copper, electro., Conn. ....	14.375	14.375	14.375	14.375	14.375	14.375
Copper, Lake, Conn. ....	14.375	14.375	14.375	14.375	14.375	14.375
Tin, Straits, New York ....	52.00	52.00	52.00	....	52.00	52.00
Zinc, East St. Louis ....	9.50	9.50	9.50	9.50	9.50	9.50
Lead, St. Louis ....	9.35	9.35	9.35	9.35	9.35	9.35

## NONFERROUS PRICES

### Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb) .....	15.00
Aluminum pig, f.o.b. shipping point .....	14.00
Antimony, American, Laredo, Tex. ....	14.50
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be.....	\$14.75
Beryllium aluminum, 5% Be; dollars per lb contained Be.....	\$30.00
Cadmium, del'd .....	\$1.25
Cobalt, 97-99% (per lb).....	\$1.50 to \$1.57
Copper, electro, Conn. Valley .....	14.375
Copper, electro, New York .....	14.125
Copper, lake, Conn. Valley .....	14.375
Gold, U. S. Treas., dollars per oz. ....	\$35.00
Indium, 99.8%, dollars per troy oz. ....	\$ 2.25
Iridium, dollars per troy oz. ....	\$125.00
Lead, St. Louis .....	9.35
Lead, New York .....	9.50
Magnesium, 99.9+%, carlots.....	20.50
Magnesium, 12-in. sticks, carlots.....	27.50
Mercury, dollars per 76-lb flask, f.o.b. New York .....	\$99 to \$100
Nickel, electro, f.o.b. refinery .....	35.00
Palladium, dollars per troy oz. ....	\$24.00
Platinum, dollars per troy oz. ....	\$70.00
Silver, New York, cents per oz. ....	90.125
Tin, Straits, New York .....	52.00
Zinc, East St. Louis .....	9.50
Zinc, New York .....	9.94
Zirconium copper, 6 pct Zr, per lb contained Zr .....	\$ 6.00

### Remelted Metals

(Cents per lb)

Aluminum, No. 12 Fdy. (No. 2) .....	11.50 to 12.00
Aluminum, deoxidizing .....	12.50
No. 2 .....	11.50
No. 3 .....	10.50
No. 4 .....	10.50
Brass Ingot—ceiling prices .....	
85-5-5 (No. 115) .....	15.50
88-10-2 (No. 215) .....	18.75
80-10-10 (No. 305) .....	18.25
No. 1 Yellow (No. 405) .....	12.50

### Copper, Copper Base Alloys

(Mill base, cents per lb)

	Extruded shapes	Rods	Sheets
Copper .....	25.66	25.81	25.81
Copper, H.R. ....	22.16	22.16	22.16
Copper drawn .....	23.16	23.16	23.16
Low brass, 80% .....	24.35	24.66	24.66
High brass .....	24.38	24.38	24.38
Red brass, 85% .....	24.67	24.98	24.98
Naval brass .....	23.84	22.59	28.53
Brass, free cut .....	18.53	18.53	18.53
Commercial, bronze .....	25.50	25.50	25.50
Manganese bronze ..	27.45	25.95	32.03
Phosphor bronze, A, B, 5% .....	43.68	43.43	43.43
Muntz metal .....	23.59	22.34	26.78
Everdur, Herculoxy, Olympic or equal ..	29.82	30.88	30.88
Nickel silver, 5% .....	34.44	32.38	32.38
Architectural bronze. ....	22.50	22.50	22.50

### Aluminum

(Cents per lb, base, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢ 24S-T, 71¢; base, 30,000 lb.

Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢; 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 53S-AL, 30.5¢; base, 30,000 lb and over.

Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb and over.

Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.

Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 27.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢ 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ to 2½ in.

(Continued, See Next Column)

diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, coiled, B & S gage 17-18: 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base; B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢; B & S 15-16: 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.

## NONFERROUS SCRAP METAL QUOTATIONS

### Copper, Copper Base Alloys

#### OPA Group 1

No. 1 wire, No. 1 heavy copper ..	12.50
No. 1 tinned copper wire, No. 1 ..	12.50
tinued heavy copper .....	12.50
No. 2 wire, mixed heavy copper ..	11.50
Copper tuyeres .....	11.50
Light copper .....	10.50
Copper borings, No. 1 .....	12.50
No. 2 copper borings .....	11.50
Lead covered copper wire, cable ..	11.50
Lead covered telephone, power cable .....	11.50
Insulated copper .....	11.50

#### OPA Group 2

Bell metal .....	18.25
High grade bronze gears .....	16.00
High grade bronze solids .....	16.00
Low lead bronze borings .....	15.75
Babbitt lined brass bushings .....	15.75
High lead bronze solids .....	15.75
High lead bronze borings .....	15.75
Red trolley wheels .....	13.50
Tinny (phosphor bronze) borings ..	13.25
Tinny (phosphor bronze) solids ..	13.25
Copper-nickel solids and borings ..	12.00
Bronze paper mill wire cloth .....	12.25
Aluminum bronze solids .....	11.75
Soft red brass (No. 1 composition) ..	12.00
Soft red brass borings (No. 1) ..	12.00
Gilding metal turnings .....	11.25
Contaminated gilded metal solids ..	11.25
Unlined standard red car boxes ..	11.00
Lined standard red car boxes ..	10.50
Cocks and faucets .....	10.50
Mixed brass screens .....	10.50
Red brass breakage .....	10.25
Old nickel silver solids .....	8.60
Old nickel silver borings .....	8.50
Copper lead solids, borings .....	7.75
Yellow brass castings .....	8.25
Automobile radiators .....	9.75
Zincy bronze solids, borings .....	10.75

#### OPA Group 3

Fired rifle shells .....	10.25
Brass pipe .....	10.50
Old rolled brass .....	9.00
Admiralty condenser tubes .....	9.50
Muntz metal condenser tubes .....	9.00
Plated brass sheet, pipe reflectors ..	8.50
Manganese bronze solids .....	8.75 <sup>1</sup>
Manganese bronze solids .....	7.75 <sup>2</sup>
Manganese bronze borings .....	8.00

#### OPA Group 4

Refinery brass .....	6.75*
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\*Price varies with analysis. <sup>1</sup>Lead content 0.00 to 0.40 pct. <sup>2</sup>Lead content 0.41 to 1.00 pct.

### Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb or more, 46¢ a lb; 25 to 90 lb, 56¢; less than 25 lb, 66¢.

### Brass Mill Scrap

Briquetted cartridge brass turnings .....	10.375
Cartridge brass turnings, loose ..	9.625
Loose yellow brass trimmings .....	9.625

### Aluminum

#### Plant scrap, segregated

2S solids .....	8.50 to 9.00
Dural alloys, solids 14, 17, 18, 24S, 25S .....	6.00 to 6.25
turnings, dry basis .....	1.50 to 1.75
Low copper, alloys 51, 52, 61, 63S solids .....	8.00 to 8.50
turnings, dry basis .....	5.00 to 6.50

#### Plant scrap, mixed

Solids .....	4.25 to 4.50
Turnings, dry basis .....	1.50 to 1.75

#### Obsolete scrap

Pure cable .....	6.50 to 7.50
Old sheet and utensils .....	5.00 to 5.50
Old castings and forgings .....	5.00 to 5.50
Pistons, free of struts .....	4.00 to 4.50
Pistons, with struts .....	2.50 to 3.00
Old alloy sheet .....	2.00 to 2.50

### Magnesium\*

#### Segregated plant scrap

Pure solids and all other solids, exempt Borings and turnings .....	1.50
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#### Mixed, contaminated plant scrap

Grade 1 solids .....	3.00
Grade 1 borings and turnings .....	2.00
Grade 2 solids .....	2.00
Grade 2 borings and turnings .....	1.00

\*Nominal.

### Zinc

New zinc clippings, trimmings ..	7.50
Engravers, lithographers plates ..	7.50
Old zinc scrap .....	5.75
Unswasted zinc dross .....	6.00
Die cast slab .....	5.50
New die cast scrap .....	5.45
Radiator grilles, old and new ..	4.50
Old die cast scrap .....	4.00

### Lead

Deduct 1.40¢ a lb from refined metal basing point prices for refinery charge on used battery plates.

Soft lead scrap .....	7.50
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### Nickel

Ni content 98+%, Cu under ½%, 23¢ per lb; 90 to 98% Ni, 23¢ per lb contained Ni.

## ELECTROPLATING ANODES AND CHEMICALS

### Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed .....	29.75
Cast, oval, 15 in. or longer .....	23.47
Electrodeposited .....	23.97
Rolled, oval, straight .....	23.97
Curved, 13 in. or longer .....	23.97
Brass, 80-20, frt allowed .....	27.25
Cast, oval, 15 in. or longer .....	16¼
Zinc, cast, 99.99, 15 in. or longer ..	16¼
Nickel, 99 pct plus, frt allowed .....	47
Cast .....	48
Rolled, depolarized .....	48
Silver, 999 fine .....	80%
Rolled, 100 oz. lots, per oz. ....	80%

### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 1-5 bbls .....	34.00
Copper sulphate, 99.5, crystals, bbls .....	7.75
Nickel salts, single, 425 lb bbls, frt allowed .....	13.50
Silver cyanide, 100 oz lots, per oz. ....	0.655
Sodium cyanide, 96 pct, domestic, 100 lb drums .....	15.00
Zinc cyanide, 100 lb drums .....	33.00
Zinc sulphate, 89 pct, crystals, bbls, frt allowed .....	6.35

# SCRAP

... News and Market Activities

## Steel Grades Dull as Cast Prices Advance

### New York

... The scrap trade early this week joined the rest of the nation in watching price control labor pains in Washington. As a result there was little activity in steel grades. Foundry grades however, were rather active pricewise.

Foundries, casting about desperately for material have been the only consumers to break through the old ceilings. Sales of cast grades are reported in isolated cases at \$2 to \$3 additional for No. 1 cupola cast in Pittsburgh. The

*Additional scrap news appears on p. 95 of this issue*

same grade, or other cast scrap somewhat overgraded, is selling for \$28.50 in Philadelphia and up to \$30 in Boston. In Buffalo the increase is \$5 a ton, while New Jersey foundries are paying \$28 delivered.

**PITTSBURGH** — Continued reports of an increase in prices of cupola cast can be confirmed only on a small scale. Some foundries that normally buy cast in small lots, mainly truckloads, have been paying \$2 to \$3 a ton over the \$20 OPA listing but large consumers are holding to the \$20 price line. One large user of cast this week informed his suppliers that he was presently holding the \$20 a ton price line but would honor any price up to \$26 a ton made because of OPA reinstatement or market conditions during the next 10 days and pay the increase retroactive for 10 days. Small users may force an upward break in prices on heavy consumers, but this is not anticipated. No steelmaking equipment is down in this area because of the lack of scrap, but it is believed that curtailments are underway in the Mahoning valley.

**CHICAGO**—Mother Hubbard tales on scrap continue to soar and whirl, observers are similarly influenced and are going around in ever increasing concentric circles, but one thing, for sure, is that the tail is wagging the dog. Inventories range from 10 to 3-days-supply with one exception, where a 30-day margin is on hand. 7700 tons of steel was lost last week when six openhearth, in one shop, went down for 24 hr because of no scrap. Two boatloads arrived here from the East, representing a shifting of internal inventory, not a new purchase. Bare as the cupboards are, the modern twist to the fable is that the mills are determined to prevent the higher prices on which some yards are speculating in

their recent, unconfirmed, premium purchases.

**PHILADELPHIA**—There is practically no steel scrap moving in this area since, aside from the current shortage, scrap dealers are refusing to make shipments at ceilings which are being adhered to by the mills. Mills acknowledge desperate need of scrap, this applies also to the largest consumer, and predict that they must close down furnaces if there is no change. Dealers predict that there will be no easing in this situation with a return of the OPA. Cast scrap has been reported sold in significant tonnages to large foundry consumers at \$28.50 delivered.

**DETROIT** — Scrap is moving a little easier early this week and at ceiling prices while the trade waited for congressional action on OPA. With pig iron being diverted to housing and agricultural uses, the squeeze on an already tight market is expected to become even tighter, particularly in the foundry grades; the larger dealers are reported to be holding firm to OPA prices. Scrap generation is about the same despite some increase in automobile production.

**BOSTON**—Sufficient No. 1 machinery cast is moving in small lots to establish a \$29 to \$30 a ton price delivered Boston market, an advance of \$9 to \$10 a ton over the last OPA ceiling price. Little foundry steel is moving, but bid and asking prices suggest a higher market and real sales within the near future. The average yard is shipping some heavy steel, turnings, bundling material, etc. at ceiling prices yet at the same time holding other tonnages in anticipation of a boost in values.

**NEW YORK**—The trend of cast grades to break through the ceiling, noted first in isolated sales during the past few weeks, has now become a definite fact. Certain consumers have been bidding up the price and a large foundry in New Jersey offered \$28 a ton delivered for No. 1 cupola cast and a number of dealers and brokers are supplying the material at this price.

**CINCINNATI**—The flow of iron and steel scrap is spotty with some dealers holding in the hope of a price increase, while others are moving tonnages promptly. So far OPA prices have been holding since mills are reluctant to accept higher costs at this time. While there has been a modest improvement in the amount of scrap in the market, this is still not sufficient to correct the desperate need of a number of consumers in the market. Cast is particularly in heavy demand, and dealers are unable to supply foundries adequately.

**CLEVELAND**—Brokers are continuing to ship on old orders in accompaniment to the now familiar refrain that much scrap is being held pending the death of OPA. One major consumer here has reported a 25-pct drop in notices as of the first of the week. Considerable over-grading is taking place but to all appearances the major consumers are holding the price line. Operations are reportedly menaced by the shortage in some plants but no shut-downs of consequence have been reported.

**BUFFALO**—Small spot shipments of cast scrap at \$25 a ton, f.o.b. shipping point, or \$5 over the OPA limit, have been made locally. Some dealers, however, are delivering cast on a "price to be determined later" basis, asserting they have no desire to "gouge" old customers. Recent rail lists sold at "price at time of shipment," which so far has been the OPA ceiling. Steel mill reserves of scrap have been hard hit by falling receipts, but curtailment has been avoided by charging more hot iron. The mills are holding the price line and getting moderate deliveries, mostly on old contracts. Their only concession has been an adjustment to take care of the increased freight on interstate shipments. A 5000-ton lake cargo, second of the month, is due Saturday from Duluth. Nothing is in the barge canal system for local consumers.

**ST. LOUIS**—Early this week the scrap iron trade in the St. Louis industrial area was at a standstill, as sellers awaited the fate of the OPA and held for higher prices. Only a few shipments are trickling in. Fabricating yards are proceeding cautiously because the elimination of OPA possibly could mean a realignment of premium grades. Mills continue to draw on yard inventories for operations.

**BIRMINGHAM**—The market here is rather demoralized with brokers offering ceiling prices but getting little or no material. Early this week the inclination was to hold on awaiting action in Washington. Meanwhile, little scrap is being prepared in this district and the threat to steelmaking grows greater each week.

**TORONTO**—As a result of the strike at the basic steel plants in Canada deliveries of scrap iron and steel to the big mills have been suspended and dealers are stockpiling steel making scrap until they can resume shipments. Receipts are holding at about the average of the previous two or three weeks although there is a possibility that as industrial plants curtail in operations due to lack of steel there will be a sharp reduction in scrap offerings. The cutting off of deliveries of pig iron to foundry melters is creating a stronger demand for cast scrap and stove plate and it is possible that some of the iron scrap that formerly went for blast furnace use may be diverted to the foundries.

# IRON AND STEEL SCRAP PRICES

## PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00*
RR. hvy. melting	21.00*
No. 2 hvy. melting	20.00*
RR. scrap rails	21.50*
Rails 3 ft. and under	23.50*
No. 1 comp'd sheets	20.00*
Hand bldd. new shts.	20.00*
Hvy. axle turn.	19.50*
Hvy. steel forge turn.	19.50*
Mach. shop turn.	15.00*
Short shov. turn.	17.00*
Mixed bor. and turn.	15.00*
Cast iron borings	16.00*
Hvy. break cast.	16.50*
No. 1 cupola	20.00*
RR. knuck. and coup.	24.50*
RR. coil springs	24.50*
Rail leaf springs	24.50*
Rolled steel wheels	24.50*
Low phos. bil. crops	25.00*
Low phos.	22.50*
RR. malleable	22.00*

## CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.75*
No. 2 hvy. melting	18.75*
No. 1 bundles	18.75*
No. 2 dealers' bndls.	18.75*
Bundled mach. shop turn.	16.75*
Galv. bundles	13.75*
Mach. shop turn.	15.75*
Short shovels, turn.	14.75*
Cast iron borings	13.75*
Mix. borings & turn.	23.75*
Low phos. hvy. forge	21.25*
Low phos. plates	19.75*
No. 1 RR. hvy. melt.	22.25*
Reroll rails	20.25*
Miscellaneous rails	22.25*
Angles & splice bars	22.25*
Locomotive tires, cut	22.25*
Cut bolsters & side frames	25.75*
Standard stl. car axles	23.25*
No. 3 steel wheels	23.25*
Couplers & knuckles	22.00*
Agricul. malleable	20.00*
RR. malleable	20.00*
No. 1 mach. cast.	22.25*
Rails 3 ft. and under	20.00*
No. 1 agricul. cast.	16.50*
Hvy. breakable cast.	15.25*
RR. grate bars	19.00*
Cast iron brake shoes	20.00*
Stove plate	20.00*
Clean auto cast.	20.00*
Cast iron carwheels	20.00*

## CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50*
No. 2 hvy. melting	19.50*
No. 1 bundles	19.50*
No. 2 bundles	19.50*
Mach. shop turn.	\$10.50 to 11.00
Shoveling turn.	12.50 to 13.00
Cast iron borings	11.50 to 12.00
Mixed bor. & turn.	11.50 to 12.00
Low phos. plate	22.00*
No. 1 cupola cast.	20.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Scrap rails	21.00*

## BOSTON

Dealers' buying prices per gross ton, f.o.b. cars

No. 1 hvy. melting	\$15.05*
No. 2 hvy. melting	15.05*
No. 1 and 2 bundles	15.05*
Busheling	15.05*
Turnings, shoveling	12.05*
Machine shop turn.	10.05*
Mixed bor. & turn.	10.05*
Cl'n cast, chem. bor.	\$13.06 to 14.15*
Machinery cast	29.00 to 30.00*
Breakable cast.	16.50*
Stove plate	19.00*

## DETROIT

Per gross ton, brokers' buying prices:

No. 1 hvy. melting	\$17.32*
No. 2 hvy. melting	17.32*
No. 1 bundles	17.32*
New busheling	17.32*
Flashings	17.32*
Mach. shop turn.	12.32*
Short shov. turn.	14.32*

Going prices as obtained in the trade by IRON AGE editors, based on representative tonnages. Where asterisks are used they indicate the former ceiling price to which must be added brokerage fee and adjusted freight.

Cast iron borings	13.32*
Mixed bor. & turn.	12.32*
Low phos. plate	19.82*
No. 1 cupola cast.	20.00*
Charging box cast.	19.00*
Hvy. breakable cast.	16.50*
Stove plate	19.00*
Automotive cast.	20.00*

## PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$18.75*
No. 2 hvy. melting	18.75*
No. 2 bundles	18.75*
Mach. shop turn.	13.75*
Shoveling turn.	15.75*
Cast iron borings	14.75*
Mixed bor. & turn.	13.75*
No. 1 cupola cast.	28.50*
Hvy. breakable cast.	16.50*
Cast, charging box	19.00*
Hvy. axle forge turn.	13.25*
Low phos. plate	21.25*
Low phos. punchings	21.25*
Billet crops	21.25*
RR. steel wheels	23.25*
RR. coil springs	23.25*
RR. malleable	22.00*

## ST. LOUIS

Per gross ton delivered to consumer:

Heavy melting	\$17.50*
Bundled sheets	17.50*
Mach. shop turn.	12.50*
Locomotive tires, uncut	21.00*
Misc. std. sec. rails	19.00*
Rerolling rails	21.00*
Steel angle bars	21.00*
Rails 3 ft. and under	21.50*
RR. springs	22.00*
Steel car axles	24.50*
Stove plate	19.00*
Grate bars	15.25*
Brake shoes	15.25*
RR. malleable	22.00*
Cast iron carwheels	20.00*
No. 1 machinery cast	20.00*
Breakable cast.	16.50*

## BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$17.00*
No. 2 hvy. melting	17.00*
No. 2 bundles	17.00*
No. 1 busheling	17.00*
Long turnings	12.00*
Shoveling turnings	14.00*
Cast iron borings	13.00*
Bar crops and plate	\$18.50 to 19.50*
Structural and plate	18.50 to 19.50*
No. 1 cast	20.00*
Stove plate	19.00*
Steel axles	18.50*
Scrap rails	18.50*
Rerolling rails	20.50*
Angles & splice bars	20.50 to 21.00*
Rails 3 ft. & under	21.00*
Cast iron carwheels	17.50 to 18.00*

## YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$20.00*
No. 2 hvy. melting	20.00*
Low phos. plate	22.50*
No. 1 busheling	20.00*
Hydraulic bundles	20.00*
Mach. shop turn.	15.00*
Short shovel. turn.	17.00*
Cast iron borings	16.00*

## NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$15.33*
No. 2 hvy. melting	15.33*
Comp. black bundles	15.33*
Comp. galv. bundles	15.33*
Mach. shop turn.	10.33*
Mixed bor. & turn.	10.33*
Shoveling turn.	12.33*
No. 1 cupola cast.	\$23.75 to 24.25

Hvy. breakable cast	16.50*
Charging box cast	19.00*
Stove plate	19.00*
Clean auto cast	20.00*
Unstrip. motor blks.	17.50*
Cl'n chem. cast bor.	14.33*

## BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.25*
No. 1 bundles	19.25*
No. 2 bundles	19.25*
No. 2 hvy. melting	19.25*
Mach. shop turn.	14.25*
Shoveling turn.	16.25*
Cast iron borings	14.25*
Cast iron borings	15.25*
Mixed bor. & turn.	14.25*
Stove plate	19.00*
Low phos. plate	21.75*
Scrap rails	20.75*
Rails 3 ft. & under	22.75*
RR. steel wheels	23.75*
Cast iron car wheels	20.00*
RR. coil & leaf spgs.	23.75*
RR. knuckles & coup.	23.75*
RR. malleable	22.00*
No. 1 busheling	19.25*

## CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$19.50*
No. 2 hvy. melting	19.50*
Compressed sheet stl.	19.50*
Drop forge flashings	19.00*
No. 2 bundles	19.50*
Mach. shop turn.	14.50*
Short shovel.	16.50*
No. 1 busheling	19.50*
Steel axle turn.	19.00*
Low phos. billet and bloom crops	24.50*
Cast iron borings	15.50*
Mixed bor. & turn.	14.50*
No. 2 busheling	17.00*
No. 1 machine cast	20.00*
Railroad cast	20.00*
Railroad grate bars	15.25*
Stove plate	19.00*
RR. hvy. melting	20.50*
Rails 3 ft. & under	23.00*
Rails 18 in. & under	24.25*
Rails for rerolling	23.00*
Railroad malleable	22.00*
Elec. furnace punch	22.00*

## SAN FRANCISCO

Per gross ton delivered to consumer:

RR. hvy. melting	\$18.00*
No. 1 hvy. melting	17.00*
No. 2 hvy. melting	17.00*
No. 2 bales	\$15.00 to 15.75
No. 3 bales	8.50 to 9.25
Mach. shop turn.	6.50 to 7.25
Elec. furn. 1 ft. und.	15.50 to 17.00
No. 1 cupola cast.	19.00 to 21.00

## LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$17.00
No. 2 hvy. melting	17.00
No. 1 bales	\$16.00 to 17.00
No. 2 bales	15.50 to 16.00
No. 3 bales	8.00 to 9.00
Mach. shop turn.	7.00
No. 1 cupola cast.	19.00 to 21.00

## SEATTLE

Per gross ton delivered to consumer:

RR. hvy. melting	\$14.50*
No. 1 & No. 2 hvy. melting	14.50*
Elec. furn. 1 ft. und.	\$14.00 to 15.00
No. 1 cupola cast.	20.00*

## HAMILTON, ONT.

Per gross ton delivered to consumer:

Heavy melting	\$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

# Comparison of Prices . .

Advances over past week in Heavy Type; declines in Italics. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(cents per pound)				
Hot-rolled sheets	2.425	2.425	2.425	2.20
Cold-rolled sheets	3.275	3.275	3.275	3.05
Galvanized sheets (24 ga.)	4.05	4.05	4.05	3.70
Hot-rolled strip				
6-in. and under	2.45	2.45	2.45	2.10
Over 6 in.	2.35	2.35	2.35	2.10
Cold-rolled strip	3.05	3.05	3.05	2.80
Plates	2.50	2.50	2.50	2.25
Plates, wrought iron	4.112	4.112	4.112	3.80
Stain's c-r strip (No. 302)	30.30	30.30	30.30	28.00

Tin and Terneplate:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(dollars per base box)				
Tinplate, standard cokes.	\$5.00	\$5.00	\$5.00	\$5.00
Tinplate, electro (0.50 lb)	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.55	4.55	4.55	4.30

Bars and Shapes:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(cents per pound)				
Merchant bars	2.50	2.50	2.50	2.25
Cold-finished bars	3.10	3.10	3.10	2.65
Alloy bars	2.92	2.92	2.92	2.70
Structural shapes	2.35	2.35	2.35	2.10
Stainless bars (No. 302)	25.97	25.97	25.97	24.00
Wrought iron bars	4.76	4.76	4.76	4.40

Wire and Wire Products:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(cents per pound)				
Bright wire	3.05	3.05	3.05	2.75
Wire nails	3.75	3.75	3.25	2.90

Rails:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(dollars per net ton)				
Heavy rails	\$43.39	\$43.39	\$43.39	\$43.00
Light rails	49.18	49.18	49.18	45.00

Semifinished Steel:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(dollars per gross ton)				
Rerolling billets	\$39.00	\$39.00	\$39.00	\$36.00
Sheet bars	38.00	38.00	38.00	36.00
Slabs, rerolling	39.00	39.00	39.00	36.00
Forging billets	47.00	47.00	47.00	42.00
Alloy blooms, billets, slabs	58.43	58.43	58.43	54.00

Wire Rods and Skelp:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(cents per pound)				
Wire rods	2.30	2.30	2.30	2.15
Skelp	2.05	2.05	2.05	1.90

Pig Iron*:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(per gross ton)				
No. 2 foundry, Phila.	\$28.34	\$28.34	\$28.34	\$26.84
No. 2, Valley furnace	26.50	26.50	26.50	25.00
No. 2, Southern, Cin'ti.	28.94	28.94	26.94	25.44
No. 2, Birmingham	24.88	24.88	22.88	21.38
No. 2 foundry, Chicago†	26.50	26.50	26.50	25.00
Basic, del'd eastern Pa.	27.84	27.84	27.84	26.34
Basic, Valley furnace	26.00	26.00	26.00	24.50
Malleable, Chicago†	26.50	26.50	26.50	25.00
Malleable, Valley	26.50	26.50	26.50	25.00
L. S. charcoal, Chicago	42.34	42.34	42.34	42.34
Ferromanganese‡	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is 60¢ per ton.  
‡ For carlots at seaboard.  
\*Subject to retroactive adjustment.

Scrap:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(per gross ton)				
Heavy melt'g steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.32	17.32	17.32	17.32
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	28.50	20.00	20.00	20.00
No. 1 cast, Chicago	20.00	20.00	20.00	20.00

Coke, Connellsville:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(per net ton at oven)				
Furnace coke, prompt	\$8.75	\$8.75	\$7.50	\$7.50
Foundry coke, prompt	9.85	9.85	9.00	9.00

Nonferrous Metals:	July 23, 1946	July 16, 1946	June 18, 1946	July 24, 1945
(cents per pound to large buyers)				
Copper, electro., Conn.	14.375	14.375	14.375	12.00
Copper, Lake, Conn.	14.375	14.375	14.375	12.00
Tin, Straits, New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	9.50	9.50	8.25	8.25
Lead, St. Louis	9.50	9.50	8.10	6.35
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	14.50	14.50	14.50	14.50

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942 and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite prices for the current quarter are an estimate based on finished steel shipments for the previous quarter. These figures will be revised when the actual data of shipments for this quarter are compiled.

# Composite Prices . .

FINISHED STEEL			
July 23, 1946	2.72115¢	per lb.	.....
One week ago	2.72115¢	per lb.	.....
One month ago	2.72115¢	per lb.	.....
One year ago	2.44076¢	per lb.	.....

HIGH				LOW			
1946	2.72115¢	Apr.	2	2.54490¢	Jan.	1	
1945	2.44104¢	Oct.	2	2.38444¢	Jan.	2	
1944	2.30837¢	Sept.	5	2.21189¢	Oct.	5	
1943	2.29176¢			2.29176¢			
1942	2.28249¢			2.28249¢			
1941	2.43078¢			2.43078¢			
1940	2.30467¢	Jan.	2	2.24107¢	Apr.	16	
1939	2.35367¢	Jan.	3	2.26689¢	May	16	
1938	2.58414¢	Jan.	4	2.27207¢	Oct.	18	
1937	2.58414¢	Mar.	9	2.32263¢	Jan.	4	
1936	2.32263¢	Dec.	28	2.05200¢	Mar.	10	
1935	2.07642¢	Oct.	1	2.06492¢	Jan.	8	
1934	2.15367¢	Apr.	24	1.95757¢	Jan.	2	
1933	1.95578¢	Oct.	3	1.75836¢	May	2	
1932	1.89196¢	July	5	1.83901¢	Mar.	1	
1931	1.99626¢	Jan.	13	1.86586¢	Dec.	29	
1930	2.25488¢	Jan.	7	1.97319¢	Dec.	9	
1929	2.31773¢	May	28	2.26498¢	Oct.	29	

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 pct of the United States output. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON			
.....	\$26.45	per gross ton	.....
.....	\$26.45	per gross ton	.....
.....	\$26.12	per gross ton	.....
.....	\$24.61	per gross ton	.....

HIGH				LOW			
26.45	July	9		25.37	Jan.	1	
25.37	Oct.	23		23.61	Jan.	2	
\$23.61				\$23.61			
23.61				23.61			
23.61				23.61			
\$23.61	Mar.	20		\$23.45	Jan.	2	
23.45	Dec.	23		22.61	Jan.	2	
22.61	Sept.	19		20.61	Sept.	12	
23.25	June	21		19.61	July	6	
23.25	Mar.	9		20.25	Feb.	16	
19.74	Nov.	24		18.73	Aug.	11	
18.84	Nov.	5		17.83	May	14	
17.90	May	1		16.90	Jan.	27	
16.90	Dec.	5		13.56	Jan.	3	
14.81	Jan.	5		13.56	Dec.	6	
15.90	Jan.	6		14.79	Dec.	15	
18.21	Jan.	7		15.90	Dec.	16	
18.71	May	14		18.21	Dec.	17	

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo Valley and Birmingham.

SCRAP STEEL			
.....	\$19.17	per gross ton	.....
.....	\$19.17	per gross ton	.....
.....	\$19.17	per gross ton	.....
.....	\$19.17	per gross ton	.....

HIGH				LOW			
\$19.17				\$19.17			
\$19.17	Jan.	2		\$18.92	May	22	
19.17	Jan.	11		15.76	Oct.	24	
\$19.17				\$19.17			
19.17				19.17			
\$22.00	Jan.	7		\$19.17	Apr.	10	
21.83	Dec.	30		16.04	Apr.	9	
22.50	Oct.	3		14.08	May	16	
15.00	Nov.	22		11.00	June	7	
21.92	Mar.	30		12.67	June	9	
17.75	Dec.	21		12.67	June	8	
13.42	Dec.	10		10.33	Apr.	29	
13.00	Mar.	13		9.50	Sept.	25	
12.25	Aug.	8		6.75	Jan.	3	
8.50	Jan.	12		6.43	July	5	
11.33	Jan.	6		8.50	Dec.	29	
15.00	Feb.	18		11.25	Dec.	9	
17.58	Jan.	29		14.08	Dec.	3	

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.



*For deep, tough draws  
and uniform results*  
USE  
**J&L DRAWING QUALITY  
STEEL SHEETS**

J&L Drawing Quality Steel Sheets are made either in fine grain or selected rim steel. J&L has consistently produced sheets that perform to perfection in heavy presses without excessive failures. The satin finish and surface of J&L sheets are highly desirable for painting, baked enameling, or lacquering.

**J&L  
STEEL**

**JONES & LAUGHLIN STEEL CORPORATION**  
PITTSBURGH 30, PA.

THE IRON AGE, July 25, 1946—117

# Iron and Steel Prices...

Steel prices shown here are f.o.b. basing points, in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. (1) Mill run sheet, 10¢ per 100 lb under base; primes, 25¢ above base. (2) Unassorted commercial coating. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25¢ per 100 lb to fabricators. (8) Also shafting. For quantities of 20,000 lb to 39,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is not used. (11) Boxed. (12) This base price for annealed, bright finish wires, commercial spring wire. (13) Produced to dimensional tolerances in AISI Manual Sect. 6. (14) Billets only. (15) 9/32 in. to 47/64 in., 0.15¢ per lb higher.

Basing Points													DELIVERED TO		
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cora	10 Pacific Ports, Cora	Detroit	New York	Phila- delphia
<b>INGOTS</b>															
Carbon, re-rolling	(\$33.00 f. o. b. mill)														
Carbon, forging	\$38	\$38	\$38	\$38	\$38	\$38	\$38								
Alloy.....	\$48.69	\$48.69				\$48.69									
	(Bethlehem, Massillon, Canton, Coatesville—\$48.69)														
<b>BILLETS, BLOOMS, SLABS</b>															
Carbon, re-rolling	\$39	\$39	\$39	\$39	\$39	\$39	\$39	\$39				\$51 <sup>14</sup>	\$41		
	(Provo—\$50.20, Duluth—\$41 <sup>14</sup> )														
Carbon, forging billets.....	\$47	\$47	\$47	\$47	\$47	\$47	\$47	\$47				\$59 <sup>14</sup>	\$49		
	(Provo—\$58.20, Duluth—\$49 <sup>14</sup> )														
Alloy	\$58.43	\$58.43				\$58.43							\$60.43		
	(Bethlehem, Massillon, Canton—\$58.43)														
<b>SHEET BARS</b>	\$38	\$38		\$38		\$38	\$38	\$38							
	(Canton—\$38)														
<b>PIPE SKELP</b>	2.05¢	2.05¢					2.05¢	2.05¢							
	(Coatesville—2.05¢)														
<b>WIRE RODS <sup>15</sup></b>															
No. 5 to 5/8 in.	2.30¢	2.30¢		2.30¢	2.30¢							2.55¢	2.80¢		
	(Worcester—2.40¢)														
<b>SHEETS</b>															
Hot-rolled	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.425¢	2.525¢	2.425¢		2.975¢	2.525¢	2.685¢	2.615¢
Cold-rolled <sup>1</sup>	3.275¢	3.275¢	3.275¢	3.275¢		3.275¢	3.275¢		3.375¢	3.275¢		3.925¢	3.375¢	3.615¢	3.635¢
Galvanized (24 gage)	4.05¢	4.05¢	4.05¢		4.05¢	4.05¢	4.05¢	4.05¢	4.15¢	4.05¢		4.60¢		4.31¢	4.24¢
Enameling (20 gage)	3.80¢	3.80¢	3.80¢	3.80¢			3.80¢		3.90¢	3.80¢		4.45¢	3.90¢	4.20¢	4.16¢
Enameling (10 Gage)	3.20¢	3.20¢	3.20¢	3.20¢			3.20¢		3.30¢	3.20¢		3.85¢	3.30¢	3.60¢	3.56¢
Long ternes <sup>2</sup>	4.05¢	4.05¢	4.05¢									4.80¢		4.45¢	4.41¢
<b>STRIP</b>															
Hot-rolled <sup>3</sup> 6 in. and under over 6 in.	2.45¢ 2.35¢	2.45¢ 2.35¢	2.45¢ 2.35¢	2.45¢ 2.35¢	2.45¢ 2.35¢		2.45¢ 2.35¢					3.10¢ 3.00¢	2.55¢ 2.45¢	2.85¢ 2.75¢	2.81¢ 2.71¢
Cold-rolled <sup>4</sup>	3.05¢	3.15¢		3.05¢			3.05¢						3.15¢	3.45¢	3.41¢
	(Worcester—3.25¢)														
Cooperage stock	2.55¢	2.55¢			2.55¢		2.55¢							2.95¢	
<b>TINPLATE</b>															
Standard cokes, base box	\$5.00	\$5.00	\$5.00		\$5.10			\$5.10	\$5.10					\$5.375	\$5.301
Electro, box	\$4.35 \$4.50 \$4.65	\$4.35 \$4.50 \$4.65	\$4.35 \$4.50 \$4.65					\$4.35 \$4.60 \$4.75	\$4.35 \$4.60 \$4.75						
<b>BLACKPLATE</b>															
29 gage <sup>5</sup>	3.30¢	3.30¢	3.30¢					3.40¢	3.40¢					3.66¢	3.59¢
<b>TERNES, MFG.</b>															
Special coated, base box	\$4.55	\$4.55	\$4.55					\$4.65	\$4.65						
<b>BARS</b>															
Carbon steel	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢					2.85¢	3.15¢	2.60¢	2.84¢
	(Duluth—2.60¢) (Provo, Utah—3.20¢)														
Rail steel <sup>6</sup>	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢						2.85¢	3.15¢		
Reinforcing (billet) <sup>7</sup>	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢				2.70¢	2.75¢	2.45¢	2.61¢
Reinforcing (rail) <sup>7</sup>	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢	2.35¢				2.70¢	2.75¢	2.45¢	
Cold-finished <sup>8</sup>	3.10¢	3.10¢	3.10¢	3.10¢		3.10¢								3.44¢	3.46¢
	(Detroit—3.15¢) (Toledo—3.25¢)														
Alloy, hot-rolled	2.92¢	2.92¢				2.92¢	2.92¢						3.02¢		
	(Bethlehem, Massillon, Canton—2.92¢)														
Alloy, cold-drawn	3.62¢	3.62¢	3.62¢	3.62¢		3.62¢							3.83¢		
<b>PLATE</b>															
Carbon steel <sup>13</sup>	2.50¢	2.50¢	2.50¢	2.50¢	2.50¢		2.50¢					2.85¢	3.05¢	2.72¢	2.71¢
	(Coatesville and Claymont—2.50¢, Provo, Utah—3.20¢)														
Floor plates	3.75¢	3.75¢										4.10¢	4.40¢		4.15¢
Alloy	3.79¢	3.79¢										4.27¢	4.49¢		4.01¢
	(Coatesville—3.79¢)														
<b>SHAPES</b>															
Structural	2.35¢	2.35¢	2.35¢		2.35¢	2.35¢						2.60¢	3.00¢		2.54¢
	(Bethlehem—2.35¢)														
<b>SPRING STEEL, C-R</b>															
0.26 to 0.50 carbon	2.80¢			2.80¢											
	(Worcester—3.20¢)														
0.51 to 0.75 carbon	4.30¢			4.30¢											
	(Worcester—4.50¢)														
0.76 to 1.00 carbon	6.15¢			6.15¢											
	(Worcester—6.35¢)														
1.01 to 1.25 carbon	8.35¢			8.35¢											
	(Worcester—8.55¢)														
<b>WIRE <sup>9</sup></b>															
Bright <sup>12</sup>	3.05¢	3.05¢		3.05¢	3.05¢							3.55¢		3.44¢	3.41¢
	(Worcester—3.15¢) (Duluth—3.10¢)														
Galvanized															
	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.00¢	4.00¢		4.00¢								4.50¢		4.39¢	4.339¢
	(Worcester—4.10¢) (Trenton—4.25¢)														
<b>PILING</b>															
Steel sheet	2.65¢	2.65¢				2.65¢						3.20¢		2.99¢	3.01¢

# PRICES

## CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

BASING POINT	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	22.99	24.67	17.01	17.47	20.69	25.29
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	22.99	24.67	17.01	17.47	20.69	25.29
Billets, P'gh, Chi, Canton, Newark, N. J., Watervliet, Syracuse, Balt.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Watervliet, Syracuse, Newark, N. J., Ft. Wayne, Titusville.	22.99	24.67	17.01	17.47	20.69	25.29
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville.	27.05	25.97	20.02	20.56	24.34	29.75
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Newark, N. J., Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet.	27.05	25.97	20.02	20.56	24.34	29.75
Plates, P'gh, Middletown, Canton.	31.38	29.21	23.28	23.80	28.67	33.00
Shapes, structural, P'gh, Chi.	27.05	25.97	20.02	20.56	24.34	29.75
Sheets, P'gh, Chi, Middletown, Canton, Balt.	38.95	36.79	28.67	31.38	35.16	38.49
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown.	25.43	23.28	18.39	18.93	25.97	37.87
Strip, c-r, P'gh, Cleve, Newark, N. J., Reading, Canton, Youngstown.	32.48	30.30	23.80	24.34	34.62	56.26
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila.	27.05	25.97	20.02	20.56	24.34	29.75
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton.	32.48	30.30	23.80	24.34	34.62	56.26
Rod, h-r, Newark, N. J., Syracuse.	27.05	25.97	20.02	20.56	24.34	29.75
Tubing, seamless, P'gh, Chi, Canton, (4 in. to 6 in.)	72.09	72.09	.....	68.49	.....	.....

## TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. \*Also Canton, O.)

An increase of 8.2 pct applies to base price and extras

	Base per lb
High speed	67¢
Straight molybdenum	54¢
Tungsten-molybdenum	57½¢
High-carbon-chromium*	43¢
Oil hardening*	24¢
Special carbon*	22¢
Extra carbon*	18¢
Regular carbon*	14¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi 3¢ higher.

## ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	per lb
Field grade	3.90¢
Armature	4.25¢
Electrical	4.75¢
Motor	5.425¢
Dynamo	6.125¢
Transformer 72	6.625¢
Transformer 65	7.625¢
Transformer 58	8.125¢
Transformer 52	8.925¢

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo. Pacific ports add 75¢ per 100 lb on all grades.

## RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., net ton	\$43.39
Angle splice bars, 100 lb	2.85
(F.o.b. basing points)	per net ton
Light rails (from billets)	\$49.18
Light rails (from rail steel)	49.18
	base per lb
Cut spikes	3.65¢
Screw spikes	5.55¢
Tie plate, steel	2.55¢
Tie plates, Pacific Coast	2.70¢
Track bolts	*4.75¢
Track bolts, heat treated, to rail-roads	*5.00¢
Track bolts, jobbers discount	63-5
*Plus a 12-pct increase effective July 1.	
Basing points, light rails, Pittsburgh, Chicago, Birmingham: cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25¢.	

## SHELL STEEL

per gross ton

3 in. to 12 in.	\$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic openhearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.

Prices delivered Detroit are \$2.00 higher; East Michigan, \$3 higher.

Price Exceptions: Follansbee Steel Corp. permitted to sell at \$13.00 per gross ton, f.o.b. Toronto, Ohio, above base price of \$52.00.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

## CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Pa.	21.00*	22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	18.72	....
Inconel-clad		
10 pct, f.o.b. Coatesville..	26.00	....
Monel-clad		
10 pct, f.o.b. Coatesville..	24.96	....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

\*Includes annealing and pickling.

## WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named	Pacific Coast Basing Points†
Standard wire nails	\$3.75	\$4.25
Coated nails	3.75	4.25
Cut nails, carloads	4.85	....

base per keg

Standard wire nails	\$3.75	\$4.25
Coated nails	3.75	4.25
Cut nails, carloads	4.85	....

base per 100 lb

Annealed fence wire	\$3.50	\$4.00
Annealed galv. fence wire	3.85	4.35

base column

Woven wire fence*	72	90
Fence posts, carloads...	74	91
Single loop bale ties†	72	97
Galvanized barbed wire**	79	89
Twisted barbed wire..	79	89

\*15½ gage and heavier. \*\*On 80-rod spools in carload quantities.

†Prices subject to switching or transportation charges.

††Add 50¢ a ton.

## ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.....	\$8.50	\$17.00
15-lb coating I.C.....	9.50	19.00
20-lb coating I.C.....	10.00	20.00

## ALLOY EXTRAS

Alloy Steel	Basic Openhearth		Electric Furnace	
	Bars and Bar-strip	Billets, Blooms and Slabs	Bars and Bar-strip	Billets, Blooms and Slabs
A 8800	0.703¢	\$14.066	\$1.244	\$24.866
A 8700	0.757	15.148	1.298	25.988
NE 9400	0.811	16.230	1.352	25.050
NE 9700	0.703	14.066	1.244	24.885
NE 8800	1.407	28.132	1.947	38.952
NE 9900	1.298	25.968	1.677	33.542

The extras shown are in addition to the base price of \$2.92 per 100 lb on finished products and \$58.43 per gross ton on semifinished steel, major basing points, as shown in table, opposite page, and are in cents per pound when applicable to bars and bar-strip and in dollars per gross ton when applicable to billets, blooms and slabs. When acid openhearth is specified and acceptable, add to basic openhearth alloy differential 0.27¢ per lb for bars and bar-strip and \$5.41 per gross ton for billets, blooms and slabs. Alloy price increases are retroactive to Mar. 1.

## PRICES

### WELDED PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh district and Lorain, Ohio, mills  
(F.o.b. Pittsburgh only on wrought pipe)  
base price—\$200.00 per net ton

#### Steel (buttweld)

	Black	Galv.
1/2-in. ....	60 1/2	48
3/4-in. ....	63 1/2	52
1-in. to 3-in. ....	65 1/2	54 1/2

#### Wrought Iron (buttweld)

	17%	+4%
1/2-in. ....	24 1/4	2 5/8
3/4-in. ....	28 5/8	9 1/8
1-in. and 1 1/4-in. ....	33	11 7/8
2-in. ....	32%	11%

#### Steel (lapweld)

	58	46 1/2
2-in. ....	61	49 1/2
2 1/2-in. and 3-in. ....	63	51 1/2

#### Wrought Iron (lapweld)

	24%	4 7/8
2-in. ....	25%	7 1/2
2 1/2-in. to 3 1/2-in. ....	28 1/8	11 3/8
4-in. ....	27	10 1/4

#### Steel (butt, extra strong, plain ends)

	58 1/2	47 1/2
1/2-in. ....	62 1/2	51 1/2
3/4-in. ....	64	54

#### Wrought Iron (same as above)

	18%	+1 1/8
1/2-in. ....	25%	4 3/4
3/4-in. ....	33	13

#### Steel (lap, extra strong, plain ends)

	56	45 1/2
2-in. ....	60	49 1/2
2 1/2-in. and 3-in. ....	63 1/2	53

#### Wrought Iron (same as above)

	28 1/4	8%
2-in. ....	34	16 1/4
2 1/2-in. to 4-in. ....	32%	14%

On buttweld and lapweld steel pipe jobbers are granted a discount of 5 pct. On L.C.I. shipments prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lapweld and one point lower discount, or \$2 a ton higher on all buttweld.

### BOILER TUBES

Seamless steel and lapweld commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft f.o.b. Pittsburgh, in carload lots

	Seamless	Lapweld,
	Cold-Drawn	Hot-Rolled
2 in. O.D. 13 B.W.G. ....	16.52	13.90
2 1/2 in. O.D. 12 B.W.G. ....	22.21	18.70
3 in. O.D. 12 B.W.G. ....	24.71	20.79
3 1/2 in. O.D. 11 B.W.G. ....	31.18	26.25
4 in. O.D. 10 B.W.G. ....	38.68	32.56

(Extras for less carload quantities)  
40,000 lb or ft and over.....Base  
30,000 lb or ft to 39,999 lb or ft.... 5 pct  
20,000 lb or ft to 29,999 lb or ft.... 10 pct  
10,000 lb or ft to 19,999 lb or ft.... 20 pct  
5,000 lb or ft to 9,999 lb or ft.... 30 pct  
2,000 lb or ft to 4,999 lb or ft.... 45 pct  
Under 2,000 lb or ft..... 65 pct

### CAST IRON WATER PIPE

Subject to retroactive adjustment for pig iron.

	Per net ton
6-in. to 24-in., del'd Chicago ....	\$66.33
6-in. to 24-in., del'd New York ....	65.60
6-in. to 24-in., Birmingham ....	57.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles or Seattle for all rail shipment; rail and water shipment less ....	80.40
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in. ....	

### BOLTS, NUTS, RIVETS, SET SCREWS

An increase of 12 pct applies to all listings  
(Effective July 1, 1946)

#### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

#### Machine and Carriage Bolts

Base discount less case lots

	Percent Off List
1/2 in. & smaller x 6 in. & shorter....	65 1/2
9/16 & 5/8 in. x 6 in. & shorter....	63 1/2
3/4 to 1 in. x 6 in. & shorter....	61
1 1/8 in. and larger, all lengths....	59
All diameters over 6 in. long....	59
Lag, all sizes ....	62
Plow bolts ....	65

#### Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

1/2 in. and smaller ....	62
9/16 to 1 in. inclusive....	59
1 1/8 to 1 1/2 in. inclusive....	57
1 3/8 in. and larger ....	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

#### Semifin. Hexagon Nuts U.S.S. S.A.E.

Base discount less keg lots

	U.S.S.	S.A.E.
7/16 in. and smaller ....	64	
1/2 in. and smaller....	62	
1/2 in. through 1 in. ....	60	
9/16 in. through 1 in. ....	59	
1 1/8 in. through 1 1/2 in. ....	57	58
1 3/8 in. and larger ....	56	

In full keg lots, 10 pct additional discount.

#### Stove Bolts

	Consumer
Packages, nuts loose ....	71 and 10
In packages ....	71
In bulk ....	80
On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.	

#### Large Rivets

(1/2 in. and larger)

	Base per 100 Lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ....	\$3.75

#### Small Rivets

(7/16 in. and smaller)

	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham ....	65 and 5

#### Cap and Set Screws

Percent Off List

	Consumer
Upset full fin, hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in. ....	64
Upset set screws, cup and oval points	71
Milled studs ....	46
Flat head cap screws, listed sizes....	36
Fillister head cap, listed sizes....	51
Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.	

### FLUORSPAR

Maximum price f.o.b. consumer's plant, \$30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

	Base price per short ton
Effective CaF <sub>2</sub> Content: 70% or more ....	\$33.00
65% but less than 70% ....	32.00
60% but less than 65% ....	31.00
Less than 60% ....	30.00

### LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer ....	\$5.45
Old range, non-bessemer ....	5.30
Mesaba, bessemer ....	5.29
Mesaba, non-bessemer ....	5.05
High phosphorus ....	5.05
Prices are for ore shipped on and after June 24, 1946, and for ore covered by adjustable pricing agreements authorized by Order No. 8, RMPR 113.	
These prices do not reflect the recent ICC increase in freight rates.	

### METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. F.o.b. shipping point, cents per lb, ton lots.  
Brass, minus 100 mesh ... 18.5¢ to 20.25¢  
Copper, electrolytic, 150 and 200 mesh ..... 21 1/2¢ to 23 1/2¢  
Copper, reduced, 150 and 200 mesh ..... 20 1/2¢ to 25 1/2¢  
Iron, commercial, 100, 200, 325, mesh 96 + % Fe..... 11¢ to 16¢  
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots..... 4¢  
Iron, hydrogen reduced, 300 mesh and finer, 98 1/2 + % Fe, drum lots ..... 63¢  
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe. 27¢ to 42¢  
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe..... 31¢  
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe..... 90¢  
Aluminum, 100 and 200 mesh..... \*25¢  
Antimony, 100 mesh ..... 30¢  
Cadmium, 100 mesh ..... \$1.40  
Chromium, 100 mesh and finer..... \$1.25  
Lead, 100, 200 & 300 mesh..... 11 1/2 to 15¢  
Manganese, minus 325 mesh and coarser ..... 44¢ to 61¢  
Nickel, 150 mesh ..... 51 1/2¢  
Silicon, minus 325 mesh and coarser ..... 26¢ to 55¢  
Solder powder, 100 mesh. 8 1/2¢ plus metal Tin, 100 mesh ..... 58 1/2¢  
Tungsten metal powder, 98%-99%, any quantity, per lb..... \$2.60  
Molybdenum powder, 99%, in 200-lb kegs, f.o.b. York, Pa., per lb. .... \$2.60  
Under 100 lb ..... \$3.00

\*Freight allowed east of Mississippi.

### COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa. ....	\$8.75
Connellsville, Pa., hand drawn..	9.35
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va. ....	8.95
Connellsville, Pa. ....	9.85
Foundry, Byproduct	
Chicago, del'd ..... 15.10	
Chicago, f.o.b. .... 14.35	
New England, del'd ..... 16.04	
Kearny, N. J., f.o.b. .... 14.40	
Philadelphia, del'd ..... 14.63	
Buffalo, del'd ..... 14.75	
Portsmouth, Ohio, f.o.b. .... 12.85	
Painesville, Ohio, f.o.b. .... 13.50	
Erie, del'd ..... 14.50	
Cleveland, del'd ..... 14.55	
Cincinnati, del'd ..... 14.60	
St. Louis, del'd ..... 15.10†	
Birmingham, del'd ..... 12.25	

†Except producers situated in states other than Missouri, Alabama or Tennessee, sellers may charge a maximum delivered price of \$15.60 in the St. Louis Mo., and East St. Louis, Ill., switching districts.

### REFRACTORIES

(F.o.b. Works)

	Per 1000
Fire Clay Brick	
Super-duty brick, St. Louis.....	\$76.05
First quality, Pa., Md., Ky., Mo., Ill., Ohio ....	60.40
First quality, New Jersey ....	65.90
Sec. quality, Pa., Md., Ky., Mo., Ill. ....	54.80
Sec. quality, New Jersey ....	57.70
Sec. quality, Ohio ....	52.95
Ground fire clay, net ton, bulk....	8.95

#### Silica Brick

	Per Net Ton
Pennsylvania and Birmingham....	\$60.40
Chicago District ....	69.30
Silica cement, net ton (Eastern)....	10.60

#### Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester ....	\$51.00

#### Magnesite Brick

	Per Net Ton
Standard, Balt. and Chester ....	\$70.00
Chemically bonded, Baltimore ....	65.00

#### Grain Magnesite

	Per Net Ton
Domestic, f.o.b. Balt. and Chester in sacks (carloads) ....	\$43.48
Domestic, f.o.b. Chewelah, Wash., in bulk ....	22.00
in sacks ....	26.00
Clinker (dead burned) dolomite, per ton East, \$9.30; Midwest, add 10¢; Mo. Valley, add 20¢.	

## PRICES

## WAREHOUSE PRICES

Delivered metropolitan areas, per 100 lb.

Cities	SHEETS			STRIP			Plates ¾ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot- Rolled (10 gage)	Cold- Rolled	Galvanized (24 gage)	Hot-Rolled					Hot- Rolled A-8617-20	Cold- Finished	Hot- Rolled, A-8742-50 Ann.	Cold- Drawn, A-8617-20	Cold- Drawn A-8742-50 Ann.	
				6 in. and Under	Over 6 in.	Cold- Rolled								
**Philadelphia.....	\$3.743	\$5.097	\$5.218a	\$4.272	\$4.172	\$5.022	\$3.855	\$3.916	\$4.072	\$4.522	\$6.016	\$7.116	\$7.372	\$8.422
New York.....	3.815	4.838 <sup>1</sup>	5.46	4.324	4.224	5.024	4.018	4.008	4.103	4.553	6.058	7.158	7.403	8.453
Boston.....	3.999	4.969 <sup>3</sup>	5.674	4.456	4.356	4.965	4.162	4.162	4.294	4.594	6.212	7.312	7.444	8.494
Baltimore.....	3.619	5.077	5.344	4.252	4.152	4.965	3.844	4.009	4.052	4.502	6.109	7.209	7.352	8.402
Norfolk.....	3.986	5.821	5.821	4.515	4.415	4.965	4.221	4.252	4.315	4.615	6.109	7.209	7.352	8.402
Chicago.....	3.475	4.425	5.581	3.95	3.85	4.90*	3.80	3.80	3.75	4.20	5.80	6.90	7.187	8.237
Milwaukee.....	3.612	4.562 <sup>1</sup>	5.537	4.087	4.077	5.037*	3.937	3.937	3.887	4.337	6.037	7.037	7.187	8.237
Cleveland.....	3.575	4.625	5.327	3.95	3.85	4.70*	3.85	3.838	3.80	4.20	6.006	7.106	7.352	8.402
Buffalo.....	3.575	4.625	5.20	4.169	4.069	4.919*	3.88	3.65	3.60	4.20	5.80	6.90	7.187	8.237
Detroit.....	3.675	4.725	5.45	4.05	3.95	4.919*	3.859	3.911	3.70	4.25	6.13	7.23	7.259	8.309
Cincinnati.....	3.65	4.70 <sup>1</sup>	5.275	4.025	3.925	4.961	3.911	3.941	3.861	4.461	6.15	7.25	7.311	8.361
St. Louis.....	3.622	4.572 <sup>1</sup>	5.581	4.097	3.997	5.181*	3.947	3.947	3.897	4.481	6.181	7.281	7.331	8.381
Pittsburgh.....	3.575	4.625	5.20	3.95	3.85	4.70*	3.85	3.65	3.60	4.20	5.80	6.90	7.187	8.237
St. Paul.....	3.797	4.747	5.635	4.272	4.172	5.352	4.122	4.122	4.072	4.811	6.202	7.302	7.352	8.402
Omaha.....	4.035	5.72	6.00	4.53	4.43	4.99	4.37	4.37	4.32	4.945	6.13	7.23	7.28	8.38
Indianapolis.....	3.745	4.795	5.37	4.12	4.02	4.99	3.88	3.88	3.83	4.43	6.13	7.23	7.28	8.38
Birmingham.....	3.675	4.875	5.20	4.05	3.95	4.99	3.80	3.80	3.75	4.903	6.13	7.23	7.28	8.38
Memphis.....	4.19	4.885	5.715	4.565	4.465	5.315	4.315	4.315	4.265	4.78	6.265	7.365	7.415	8.465
New Orleans.....	4.263*	5.304	5.808	4.658	4.558	5.408	4.408	4.408*	4.358*	5.079	6.358	7.458	7.508	8.558
Houston.....	4.85	6.60 <sup>1</sup>	6.55	5.30	5.20	6.80	4.80	4.70	4.65	6.03	7.13	7.18	7.23	8.28
Los Angeles.....	4.12	6.87	6.35	4.60	4.50	4.15	4.15	4.15	4.30	5.78	6.15	7.25	7.30	8.35
San Francisco.....	4.87 <sup>5</sup>	7.27 <sup>2</sup>	6.40	4.60	4.50	5.00 <sup>5</sup>	4.70 <sup>5</sup>	4.70 <sup>5</sup>	4.60 <sup>5</sup>	6.23	7.33	7.38	7.43	8.48
Seattle.....	4.87 <sup>4</sup>	6.82 <sup>2</sup>	6.20	5.10	5.00	5.00 <sup>4</sup>	4.70 <sup>4</sup>	4.70 <sup>4</sup>	4.60 <sup>4</sup>	5.98	6.15	7.25	7.30	8.35
Portland.....	4.87 <sup>4</sup>	6.82 <sup>2</sup>	6.20	5.10	5.00	5.00 <sup>4</sup>	4.70 <sup>4</sup>	4.70 <sup>4</sup>	4.60 <sup>4</sup>	5.98	6.15	7.25	7.30	8.35
Salt Lake City.....	4.75	6.62 <sup>7</sup>	6.62 <sup>7</sup>	5.88	5.78	5.23 <sup>7</sup>	5.23 <sup>7</sup>	5.23 <sup>7</sup>	5.13	6.35	7.45	7.50	7.55	8.60

## BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars, 1500 lb base.

NE ALLOY BARS: 1000 to 39,999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 450 to 3749 lb; (4) 300 to 4999 lb; (5) 300 to 10,000 lb; (6) 2000 lb and over; (7) 3500 lb and over.

(a) Philadelphia: Galvanized sheet, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

\* Add 0.271¢ for sizes not rolled in Birmingham.

\*\* City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

## PIG IRON PRICES

Per gross ton, subject to retroactive adjustment.

These prices do not reflect the recent ICC increase in freight rates. New prices will be published as soon as various state commissions approve the increases.

## BASING POINT PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	27.00	27.50	28.00	28.50	32.00
Birdsboro	27.00	27.50	28.00	28.50	32.00
Birmingham	25.50	26.00	26.50	27.00	32.00
Buffalo	25.50	26.00	26.50	27.00	32.00
Chicago	26.00	26.50	27.00	27.50	32.00
Cleveland	26.00	26.50	27.00	27.50	32.00
Detroit	26.00	26.50	27.00	27.50	32.00
Duluth	26.50	27.00	27.50	28.00	32.00
Erie	26.00	26.50	27.00	27.50	32.00
Everett	27.00	27.50	28.00	28.50	32.00
Granite City	26.00	26.50	27.00	27.50	32.00
Hamilton	26.00	26.50	27.00	27.50	32.00
Neville Island	26.00	26.50	27.00	27.50	32.00
Provo	24.00	24.50	25.00	25.50	32.00
Sharpsville	26.00	26.50	27.00	27.50	32.00
Sparrows Point	27.00	27.50	28.00	28.50	32.00
Swedeland	27.00	27.50	28.00	28.50	32.00
Toledo	26.00	26.50	27.00	27.50	32.00
Youngstown	26.00	26.50	27.00	27.50	32.00

## DELIVERED PRICES (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	0.50	27.50	28.00	28.50	29.00	32.00
Boston	Birdsboro-Steelton	4.02	29.50	30.00	30.50	31.00	34.02
Brooklyn	Bethlehem	2.50	28.00	28.50	29.00	29.50	32.50
Brooklyn	Birdsboro	2.92	28.42	28.92	29.42	29.92	32.92
Canton	Clev. Ygtn, Sharpsvil.	1.39	27.39	27.89	28.39	28.89	31.89
Canton	Buffalo	3.19	29.19	29.69	30.19	30.69	33.69
Cincinnati	Birmingham	4.06	29.56	30.06	30.56	31.06	34.06
Cincinnati	Hamilton	1.11	27.11	27.61	28.11	28.61	31.61
Cincinnati	Buffalo	4.40	31.40	31.90	32.40	32.90	35.90
Jersey City	Bethlehem	1.53	28.53	29.03	29.53	30.03	33.03
Jersey City	Birdsboro	1.94	28.94	29.44	29.94	30.44	33.44
Los Angeles	Provo	4.95	28.95	29.45	29.95	30.45	33.45
Los Angeles	Buffalo	15.41	43.41	43.91	44.41	44.91	47.91
Mansfield	Cleveland-Toledo	1.94	27.94	28.44	28.94	29.44	32.44
Mansfield	Buffalo	3.36	30.36	30.86	31.36	31.86	34.86
Philadelphia	Swedeland	0.84	27.84	28.34	28.84	29.34	32.34
Philadelphia	Birdsboro	1.24	28.24	28.74	29.24	29.74	32.74
San Francisco	Provo	4.95	28.95	29.45	29.95	30.45	33.45
San Francisco	Buffalo	15.41	43.41	43.91	44.41	44.91	47.91
Seattle	Provo	4.95	28.95	29.45	29.95	30.45	33.45
Seattle	Buffalo	15.41	43.41	43.91	44.41	44.91	47.91
St. Louis	Granite City	0.50	27.50	28.00	28.50	29.00	32.00
St. Louis	Buffalo	7.07	34.57	35.07	35.57	36.07	39.07

\* \$22.88 to \$26.88.

† \$26.94 to \$30.94.

(1) Struthers Iron &amp; Steel Co., Struthers, Ohio, may charge 50¢ per ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

Charcoal pig iron base prices for Lyles, Tenn., and Lake Superior furnaces, \$33.00 and \$34.00, respectively. Newberry Brand of Lake Superior charcoal iron \$39.00 per g.t., f.o.b. furnace. Delivered to Chicago, \$42.34.

High phosphorus iron sells at Lyles, Tenn., at \$28.50.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each

0.50 pct manganese content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron, silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$32.00; f.o.b. Buffalo—\$33.25. Add \$1.00 per ton for each additional 0.50 pct Si. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for prices of comparable analysis.

# FERROALLOY PRICES

## Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk) .....	\$135.00
Less ton lots (packed) .....	148.50
F.o.b. Pittsburgh .....	139.50
\$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.	
Briquets—cents per pound of briquet, freight allowed, 66% contained Mn.	
	Eastern Central Western
Carload, bulk ..	6.05 6.30 6.60
Ton lots .....	6.65 7.55 8.55
Less ton lots ..	6.80 7.80 8.80

## Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn	19-21% Mn
	3% max. Si	3% max. Si
Carloads .....	\$35.00	\$36.00
Less ton .....	47.50	48.50
F.o.b. Pittsburgh, Chicago .....	40.00	

## Manganese Metal

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, bulk .....	30
L.c.l. lots .....	32

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads .....	32
Ton lots .....	34
Less ton lots .....	36

## Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.10% max. C, 0.06% P, 90% Mn .....	21.00	21.40	21.65
0.10% max. C .....	20.50	20.90	21.15
0.15% max. C .....	20.00	20.40	20.65
0.30% max. C .....	19.50	19.90	20.15
0.50% max. C .....	19.00	19.40	19.65
0.75% max. C .....			
7.00% max. Si .....	16.00	16.40	16.65

## Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk .....	6.05
Ton lots .....	6.70
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet.	5.80
Ton lots .....	6.30
Less ton lots .....	6.55

## Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$51.25 f.o.b. Keokuk, Iowa; \$48.00 f.o.b. Jackson, Ohio; \$49.25 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 per ton for low impurities, not to exceed: P—0.05%, S—0.04%, C—1.00%.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots, packed.

	Eastern	Central	Western
96% Si, 2% Fe ..	13.10	13.55	16.50
97% Si, 1% Fe ..	13.45	13.90	16.80

## Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si.

	Eastern	Central	Western
Carload, bulk ..	3.60	3.75	3.90
Ton lots .....	4.05	4.55	4.60
Less ton lots ..	4.45	4.80	4.85

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
50% Si .....	7.05	7.50	7.65
75% Si .....	8.55	8.70	9.25
80-90% Si .....	9.50	9.65	10.15
90-95% Si .....	11.80	11.95	12.40

## Ferrochrome

(65-72% Cr, 2% max. Si)  
Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C .....	23.00	23.40	24.00
0.10% C .....	22.50	22.90	23.50
0.15% C .....	22.00	22.40	23.00
0.20% C .....	21.50	21.90	22.50
0.50% C .....	21.00	21.40	22.00
1.00% C .....	20.50	20.90	21.50
2.00% C .....	19.50	19.90	20.50

66-71% Cr, 4-10% C ... 14.50 14.90 15.00  
62-66% Cr, 5-7% C ... 15.05 15.45 15.55

Briquets—contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk ..	9.20	9.50	9.90
Ton lots .....	9.80	10.30	11.80
Less ton lots ..	10.10	10.60	12.10

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low-carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N. High-carbon type: 66-71% Cr, 4-5% C, 0.75% N. Add 5¢ per lb to regular high-carbon ferrochrome price schedule.

## S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload .....	15.60	16.00	16.10
Ton lots .....	16.65	17.30	18.50
Less ton lots ..	17.30	17.95	19.15

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

	Eastern	Central	Western
Carload .....	20.00	20.40	21.00
Ton lots .....	21.00	21.65	22.85
Less ton lots ..	22.00	22.65	23.85

## Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed. 97% min. Cr, 1% max. Fe.

	Eastern	Central	Western
0.20% max. C ..	83.50	85.00	86.25
0.50% max. C ..	79.50	81.00	82.25
9.00% min. C ..	79.50	81.00	82.25

## Chromium—Copper

Contract price, cents per pound of alloy, f.o.b. Niagara Falls, freight allowed east of the Mississippi. 8-11% Cr, 88-90% Cu, 1.00% max. Fe, 0.50% max. Si.

Shot or ingot .....

## Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads .....	13.00	13.50	15.55
Ton lots .....	14.50	15.25	17.40
Less ton lots ..	15.50	16.25	18.40

## Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads .....	15.50	16.00	18.05
Ton lots .....	16.50	17.35	19.10
Less ton lots ..	17.00	17.85	19.60

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1¢ for central zone; 5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots .....	\$1.35	\$1.75	\$4.25
Less ton lots ..	1.60	2.00	5.00

## CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

	Eastern	Central	Western
Ton lots .....	12.00	12.75	14.75
Less ton lots ..	12.50	13.25	15.25

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots .....	11.75	12.50	14.50
Less ton lots ..	12.25	13.00	15.00

## SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe.

	Eastern	Central	Western
Ton lots .....	12.00	12.85	14.60
Less ton lots ..	12.50	13.35	15.10

## Other Ferroalloys

Ferrotungsten, standard, lump or 1/4X down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained T, 5 ton lots, freight allowed .. \$1.88

Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.

Openhearth .....	\$2.70
Crucible .....	\$2.80
High speed steel (Primos) ..	\$2.90

Vanadium pentoxide, 88-92% V<sub>2</sub>O<sub>5</sub> technical grade, contract basis, per pound contained V<sub>2</sub>O<sub>5</sub> .. \$1.10

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb.

Ton lots .....	\$2.25
Less ton lots .....	\$2.30

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo .. 95¢

Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo .. 80¢

Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo .. 80¢

Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo .. 80¢

Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti .. \$1.23

Less ton lots .....

Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti .. \$1.35

Less ton lots .....

High-carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads .. \$142.50

Ferrophosphorus, 18%, electric or blast furnaces, f.o.b. Anniston, Ala., carlots, with \$3 unitage freight equalled with Rockdale, Tenn., per gross ton .. \$53.50

Ferrophosphorus, Electrolytic, 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage freight equalized with Nashville, per gross ton .. \$75.00

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy .. 14¢

Carload lots .....

Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy .. 4.60¢

Carload, bulk .....

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Niagara Falls, carload .. 5.75¢

Ton lots .....

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound Car lots .. 8.00¢

Ton lots .....

Less ton lots .....

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alloy strip — gauges thin as .001

• It wasn't available from any source . . . it provides many fabricating advantages . . . so CMP made possible your specifying cold rolled alloy strip in extra thin gauges with all the usual characteristics, uniformity and accuracy inherent in other Thinsteel products.

*Depending on the grade, here are some of the advantages over carbon steels —*

Weight can be reduced without loss of strength. By maintaining equal weight, strength can be greatly increased.

High tensile values are obtainable in certain alloy Thinsteel grades.

Unusual fatigue resistance demonstrable by flexing tests.

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THE IRON AGE, July 25, 1946—123



## Towmotor and the 40 Fertilizers

**S**cheduling the production of forty varieties of fertilizer to meet variable demands for each type presents a complex production problem. At the Camden, N. J., plant of I. P. Thomas & Son Company, chemical manufacturers, this problem was further complicated by a lack of space in which to accumulate stock to meet future requirements.

To establish a controlled schedule that would permit long, economical production runs, four Towmotor Lift Trucks were selected to maintain a steady flow of materials through the plant and to provide the additional storage space required. Operating in a dust-laden atmosphere, these units stack 2,000-lb. loads of bagged fertilizer to 12-foot heights, in a systematic sequence that makes each grade

immediately accessible when needed. In addition to creating added storage space, Towmotors have reduced over-all handling time 40% and have materially speeded up truck loading operations.

For every handling problem, however unusual, there is an engineered solution... a solution based upon Towmotor experience and "know-how" gained in solving handling problems in every industry. Send for your copy of the Towmotor Lift Truck ANALYSIS GUIDE today. Towmotor Corporation, 1230 East 152nd Street, Cleveland 10, Ohio.

**TAKE IT UP WITH  
TOWMOTOR  
THE ONE-MAN-GANG**

## NEWS OF INDUSTRY

### Dollar Revaluation May Help Canadian Machine Tool Buyers

Cleveland

• • • Revaluation of the Canadian dollar was a move not without significance in the machine tool export market, according to qualified observers here, who are quick to point out that in simplest terms this means that Canadian manufacturers can buy U. S. machine tools 10 pct under the former market prices, in itself something of a stimulant for purchase of machine tools not made in Canada.

While some export experts felt the move was premature, this action by the Canadian government will nonetheless permit Canadian manufacturers to buy English machine tools at a slight discount also, since the British pound is tied to the U. S. dollar. In some quarters here, possibility that other countries, chiefly England and some of the more prosperous South American nations, might be inspired to do the same thing was the cause of some light-hearted speculation. In theory, of course, such a move would create a tremendous market for U. S. machine tools.

With unfilled foreign orders totaling \$50,634,336, or 27.7 pct of the entire machine tool order backlog as of the end of May, the current importance of the export market becomes readily apparent. Contrary to the role it has played in the past, the export market is now a constant in the machine tool builder's sales equation. In the past, when exports of machine tools exceeded 20 pct it was usually because there was a depression in the United States.

Some segments of the machine tool industry have probed the possibilities of export market to a very considerable extent and at the present time, between 50 and 60 pct of the machine tool builders are actively exporting. Many are equipped to export on a large scale, which in turn means that they are assuming a great risk. It goes without saying that very considerable amounts of money are involved in establishing a foreign market.

The machine tool industry will, in future, surpass normal previous peacetime exports in dollar totals, if not in units. It is curious to

# STOP SCRAP

BEFORE IT HAPPENS

with

## PROTECTIVE GAGING



The extra care and thoroughness characteristic of every phase of Cadillac Gage manufacture result in extra accuracy and thus extra *protection* for your machined product—extra protection that proves its value in much more thorough and more dependable checking of machined parts. Guarding final assemblies with invariable dimension control, Cadillac *dependable, protective accuracy* stops costly scrap before it happens.

Cadillac dependable accuracy pays real dividends in other ways, too—in faster, easier assembly, elimination of hand fitting, higher production of finished work. High-precision, thoroughly reliable Cadillac gages help you obtain the maximum efficiency possible in your production process.

More than 10,000 gages in standard sizes are in stock awaiting your order to ship.

**PHONE US — REVERSE THE CHARGES!**

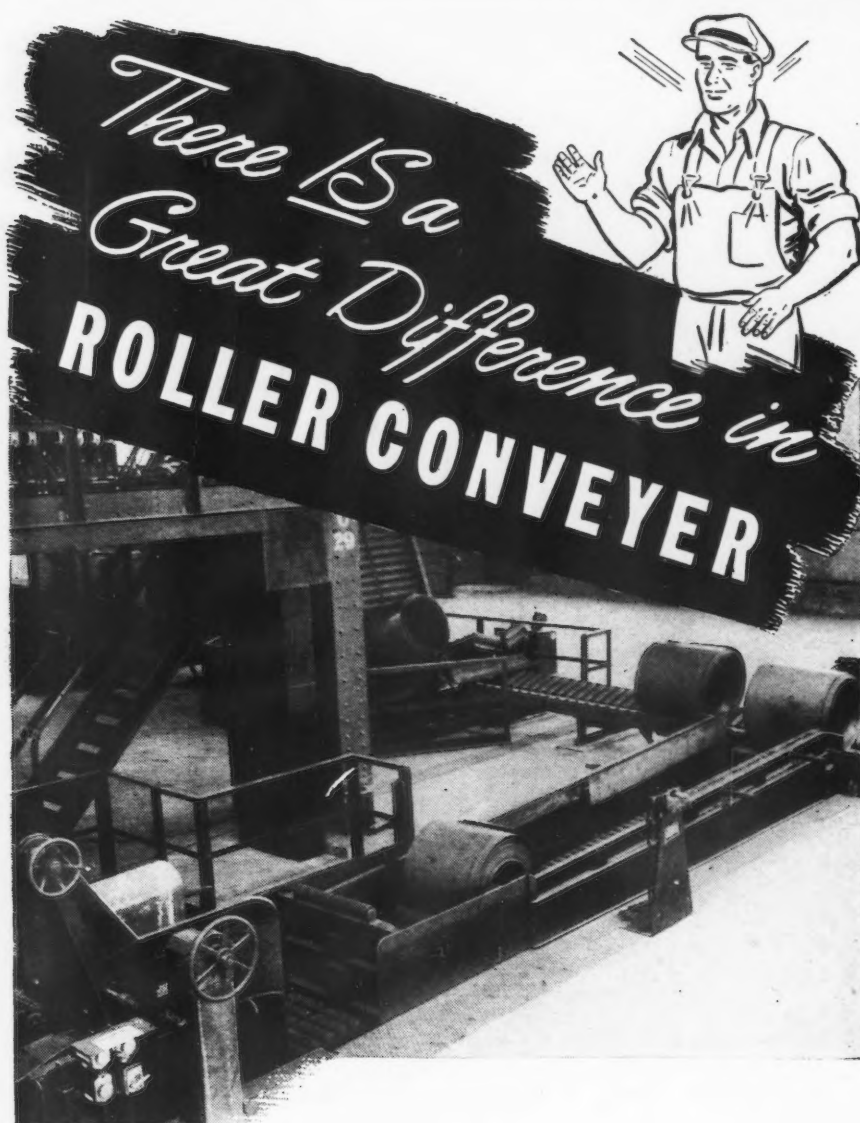
We welcome your inquiries as well as your orders. We invite you to phone us regarding any gaging problem whatever—and reverse the charges. Cadillac protective gaging specialists place their skill and knowledge at your disposal free of charge.



*Cadillac*

**GAGE COMPANY**

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**W**HEN you buy Roller Conveyor, keep in mind the service that you should expect from it. While two sections of different manufacture may appear to be of identical design, actually there is probably a vast difference in them. The gauge and quality of tubing used — the design of the bearings and the method of their lubrication. The size and style of axles, and the method of securing them in frames. The construction and cross-bracing of the frames. The couplings and supports. The weight and strength of the section. These are points which should be considered important. They quickly show that there is a difference in Roller Conveyor.

There is 40 years' experience behind Mathews Roller Conveyor. It is engineered to give long, efficient service, and each section is designed to meet specific customer requirements. We will gladly mail you complete data without obligation.

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 ENGINEERING OFFICES IN PRINCIPAL CITIES

## NEWS OF INDUSTRY

note, according to a well-informed observer, that exports of machine tools abroad make better markets for other machines here.

Exports surprisingly have made it possible to sell machine tools at lower prices in the domestic market, through volume production, and in 1932 made it possible for some segments of the industry to survive and for many to keep key men.

### Chicago Greet First Dutch Ship Since 1940

Chicago

• • • The first Dutch freighter to dock here since 1940 was the Prins Maurits, of the Oranje Line. The vessel arrived recently with a cargo of about 1000 tons of Newfoundland newsprint; also included were liquor, aluminum and other general commodities.

Special custom ruling the bulk of the newsprint cargo allowed it to be transferred directly to the holds of two barges moored alongside the vessel, for shipment via the inland waterways to Nashville, Tenn. The 258-ft, 11 knot, coal burning steamship left Rotterdam May 29 with a crew of 27 for the 3450 mile trip.

The return tonnage of the vessel will include approximately 600 tons of relief clothing for Holland. Included in the cargo loaded at the North Pier Terminal Docks was another 600 tons of 15 to 20 different commodities including machinery, iron and steel, agricultural implements, special type coal miners' boots and about 50 tons of tires and tubes. Additional steel products are to be taken on at East Chicago. Automotive products are to be loaded at Detroit and Windsor on the vessel's return through the lakes. The steamer's lake limit of 1600 tons will be completed at Cleveland. Shipments to go abroad comprise between 25 and 30 different commodities. Ocean going capacity of 2600 tons will be consummated at Montreal.

Local officials of the line hailed the direct steamship service between Great Lakes ports, and Rotterdam, Antwerp and London, as of considerable benefit to foreign traders here. The Netherlands Government, they asserted, is making every effort to build its export trade to improve its foreign exchange position.

# MICHIGAN

## WELDED STEEL TUBING

*Fabricated  
PARTS  
OF WELDED STEEL TUBING  
TO YOUR DESIGN*



**ROUND, SQUARE,  
RECTANGULAR AND  
SPECIAL SHAPES**

- IN COMMERCIAL LENGTH
- CUT TO SPECIAL LENGTHS



**SQUARE**

$\frac{1}{4}$ " to  $2\frac{1}{2}$ "  
14 to 20 gauge



**ROUND**

$\frac{1}{4}$ " to 4" O. D.  
9 to 22 gauge



**RECTANGULAR**

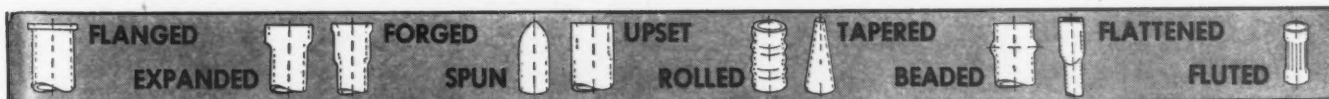
$\frac{1}{4}$ " to  $2\frac{1}{2}$ "  
14 to 20 gauge

### *Adaptability!*

Michigan Welded Steel Tubing is available in sizes and shapes that make it readily usable in the production of a wide variety of parts.

Whether you form and machine the parts in

your plant or order them prefabricated by Michigan, you will find this tubing exceptionally uniform in structure and adapted to reworking by any production process. Michigan welded tubing can be:



Engineering advice and technical help in the selection of tubing best suited to your needs. Address your inquiries to:

## *Michigan* **STEEL TUBE PRODUCTS CO.**

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**DISTRIBUTORS:** Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—C. A. Russell, Inc., Houston, Texas—Drummond, McCall & Co., Ltd., Toronto, Canada.

## Patent Office Seeks New System for Filing Of Technical Material

Washington

• • • The U. S. Patent Office, Dept. of Commerce, wishes that the nation's inventors would come forward with a new system of classifying technical knowledge which is now multiplying at such a rapid rate that it threatens to throttle not only the work of the Patent Office, but of scientists and inventors as well.

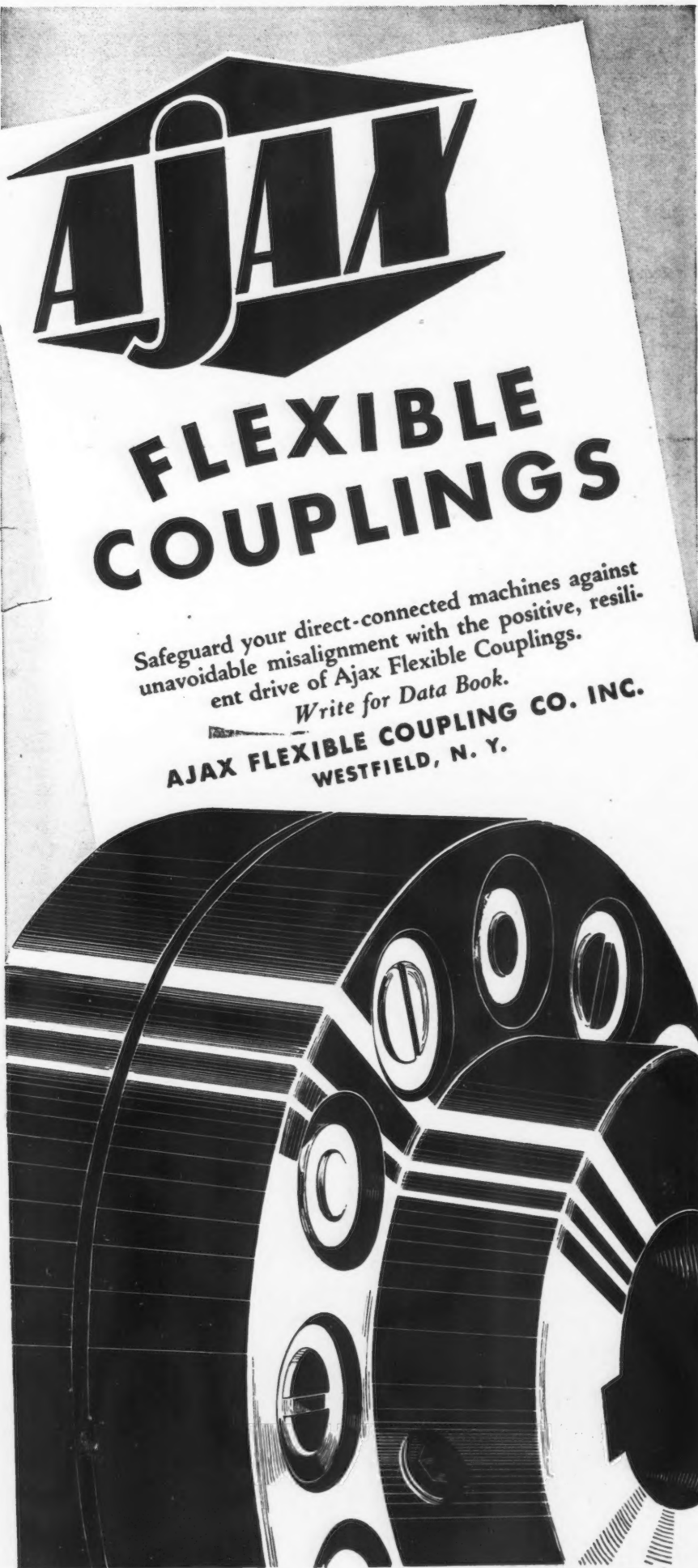
Existing systems of classifying human knowledge are hopelessly inadequate to meet modern needs, according to Casper W. Ooms, Commissioner of Patents. The result is that an increasingly large body of technical scientific information cannot be classified so that it can be utilized to the fullest extent. Scientists and inventors are often hampered in their work by having to grope their way through the increasingly great bibliographical disorder in the various fields in which they are interested.

Since the present patent system was established in 1836, nearly 2.5 million patents have been issued and new patents are pouring in at the rate of 8000 a month as the pace of technical development throughout the industrial world moves ever faster. Many modern patents, such as those in electronics and chemistry, are very complicated, and the problem of classification has been intensified a thousand-fold.

The law requires that an American patent can be issued for new inventions or disclosures. It frequently happens that individual inventors working wholly apart and often in widely separated parts of the world, hit upon essentially the same invention at about the same time. The Patent Office must decide in each individual case who is, in fact, the first inventor.

As an example of the inadequacy of the present classification system, Mr. Ooms cited one small branch of the chemical field, carbon compounds. Under this heading more than 76,000 American and foreign patents are listed.

Further developments of machine punch-card systems, now widely adapted to accounting and bookkeeping methods, may provide



**AJAX**

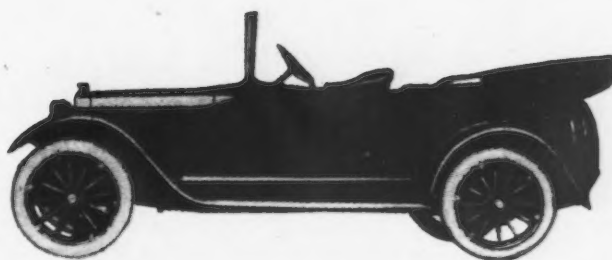
**FLEXIBLE  
COUPLINGS**

Safeguard your direct-connected machines against  
unavoidable misalignment with the positive, resilient  
drive of Ajax Flexible Couplings.  
Write for Data Book.

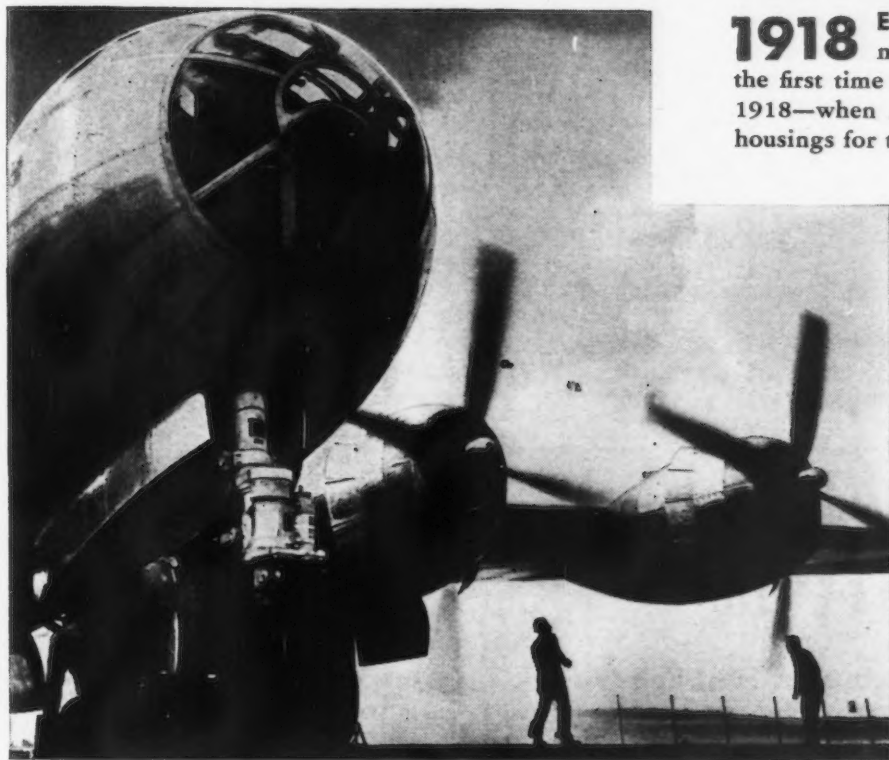
**AJAX FLEXIBLE COUPLING CO. INC.**  
WESTFIELD, N. Y.

# 1918 Motor Cars and 1946 Planes

**WELDING MADE THEM  
POSSIBLE**



**1918** Electric arc welding, as a practical mass-production tool, was used for the first time in the building of automobiles in 1918—when A. O. Smith welded the rear axle housings for the 1919 Chalmers motor car.



## 1946

Today, A. O. Smith research developments make welding the modern production tool for all transportation—automotive, rail, ship, plane. Every B-29, for example, lands on SMITHway-welded landing gear.

### THE PROOF IS IN PRODUCTION

America's tremendous industrial production—in peace and war—could not be achieved without the modern production tool, welding.

More than 7 million tons of steel products have been welded by A. O. Smith, whose plants have used as many as 320,000 SMITHway Electrodes *daily*. Millions more are used by fabricators and builders everywhere.

For detailed specifications of SMITHway Electrodes and their application to specific welding jobs, write for the SMITHway Welding Catalog.

#### SMITHway A. C. Welders

A complete line of six models—150-, 200-, 250-ampere capacity; and for heavy-duty service, 300-, 400-, and 500-ampere capacity. Write for complete specifications and prices.



made by welders... for welders

Mild Steel... High Tensile... Stainless Steel... Welding Electrodes

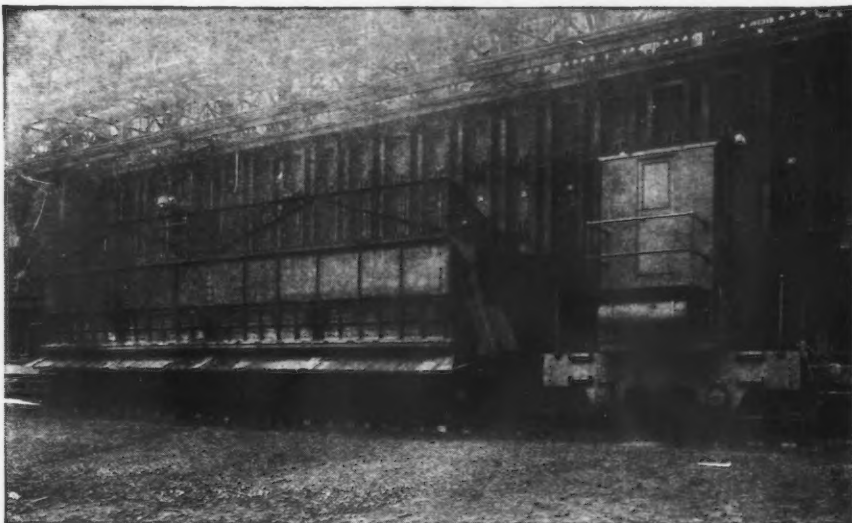
**SMITHway  
Certified  
WELDING  
ELECTRODES**



## A. O. SMITH Corporation

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CLEVELAND 4 • ATLANTA 2 • CHICAGO 4 • INDIANAPOLIS 2 • MIDLAND 2 • DALLAS 1  
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## COKE OVEN EQUIPMENT



## QUENCHING CARS AND LOCOMOTIVES

All Atlas Coke Oven Equipment is of heavy-duty construction permitting the peak operating conditions required in today's stepped-up production schedules. As a result of years of experience, Atlas is able to design and build equipment, to meet the requirements of each particular coke plant. Detailed information available on request.

### Other ATLAS Products

Ore Transfer Cars	Locomotives for
•	Switching and Interplant
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*The* **ATLAS CAR & MFG. CO.**

ENGINEERS

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### NEWS OF INDUSTRY

a solution to the classification problem, Mr. Ooms said. However, no punch-card machine has yet been devised capable of carrying in its mechanical brain all of the diverse facts that must be recorded in even a relatively simple patent.

Another solution might be the development of readily-understandable terms, a universal system of nomenclature. Such a system should be world-wide in its application because the development of scientific knowledge is shared by all industrial countries, and part of the present difficulty arises from the different classification systems now in use throughout the world.

### Charters New ASM Group

Cleveland

• • • A charter for the formation of the Los Alamos N. M. chapter of the American Society for Metals, first technical or scientific society to be established at the atomic bomb project at Los Alamos, has been granted 37 metallurgists, physicists, chemists, engineers and technicians engaged in the atom bomb project. This will be the 69th ASM chapter within the United States and Canada and brings the society's membership to more than 20,000.

W. H. Eisenman, national secretary, American Society for Metals, in announcing the action of the board of trustees, stated that, "in view of the stated permanency of the Los Alamos Atomic Bomb Laboratory project and because of the desire of many of its scientists for a chapter of the society there, the board of trustees has unanimously approved the granting of this charter."

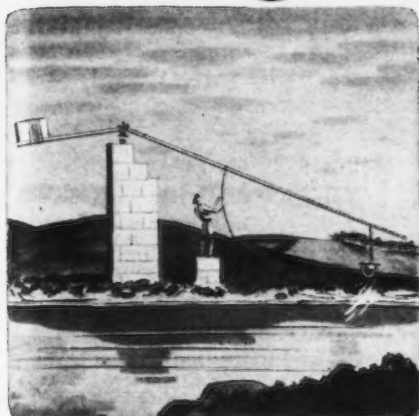
Los Alamos chapter officers include Frank Kubosch, chairman; Harvey L. Slatin, vice chairman; James M. Taub, secretary, and Harold H. Hirsch, treasurer. Trustees are Walter F. Arnold, Gerald Tenney, William W. Wellborn, Eric R. Jette and Rex Peters.

Several of the officers and directors were formerly prominent in ASM activities in their own cities, including Frank Kubosch (chairman of the Milwaukee chapter), Harold Hirsch (New York City chapter), James Taub (Cleveland), Eric Jette (New York, N. Y.) and Rex Peters (Houston, Texas).



Old Reliable Red Band Says—

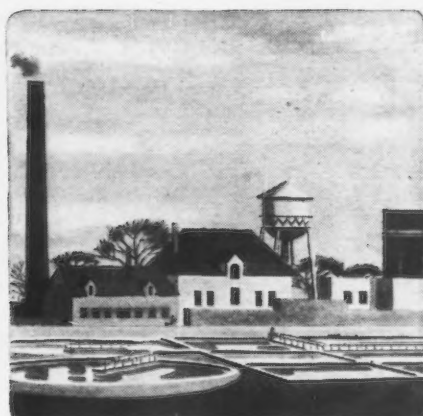
*"It all started with  
a Bucket Brigade!"\**



**1** Earliest recorded mechanical water-works system was known as the "Shadoof." Water was scooped for the Pharaohs' water supply out of the Nile. . . . Relays of slaves worked chains of buckets, day and night. . . . In 1485 B.C., the exiled brother of Rameses II took this method to Greece.



**2** As early as 300 B.C., miles of crude, hand-made aqueducts were carrying water from Alpine springs to Rome, where matrons filled household water jars at public fountains in the streets. . . . Early American colonists dug community wells—built cisterns to catch rain water.



**3** Today, electrical horsepower from thousands of industrial type motors pump water for public requirements and industry—pump fluids for industrial processes. . . . Howell has specialized in building motors for pumps and other industrial needs for more than 30 years.

## Have you a hard job for Horsepower?

Howell Motors are better than ever today. The reasons: Years of experience in building industrial type motors to meet the exacting requirements of the automotive, machine tool, dairy, food and other important industries.

Howell Motors are quality-motors. They are smooth-operating because they are statically and dynamically balanced. They are better performing because they are built of the finest materials—copper or bronze rotors—and completely

insulated. They are trouble-free on the job because they are designed for the toughest tasks in industry—consequently, they perform better on all jobs.

For your needs, in specialized or standard motors, phone the nearest Howell Representative. Remember, you pay no more for industrial type Howell Motors . . . but you always get top quality for your money.

*\*Another historic story by Old Reliable Red Band*



Howell Protected Type Motors available in sizes 5 h.p. and smaller. Also other sizes of Howell industrial type motors available up to 150 h.p.



# HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Manufacturers of Quality Industrial Type Motors Since 1915

# BAKER *Articulated* FORK TRUCK places loads at RIGHT ANGLES to 7 ft. AISLES!



*Above*—Baker 2-ton Articulated Fork Truck spotting pallet load of parts beside machine at right angle to 7 ft. aisle.

*Right*—36 inch pallet-load of machined pedestal shoe castings are handled easily in close quarters. Distance between white lines—7 ft.

A striking example of the BAKER *Articulated* Fork Truck's successful operation in congested areas is the case of the locomotive division of a large electrical manufacturer. In this plant, heavy parts are handled on pallets between manufacturing processes. Conventional power trucks could not be used effectively because many of the aisles were only 7 ft. wide. BAKER *Articulated* Fork Trucks satisfactorily solved the problem, enabling the company to mechanize handling operations without costly plant alterations.

*For complete information on Baker Articulated Fork Trucks get in touch with your nearest Baker representative—or write us direct.*



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## Baker INDUSTRIAL TRUCKS

### NEWS OF INDUSTRY

## Chemical Society Sees Scarcity of Scientists Threatening Research

New York

• • • A scarcity of top-flight scientists, dangerously slowing fundamental research, exists in the United States, declares *Industrial & Engineering Chemistry*, a publication of the American Chemical Society.

"The dramatic story of the atom bomb brings home to informed Americans the startling and thoroughly disturbing fact that a large proportion of the advances in pure or fundamental research, not only in physics, but in biology, chemistry, medicine, and in practically every field of science, has been made by citizens of other countries," the journal says.

"Comparison with any one other country will indicate that the United States has played a very significant role in the forward march of science, but when the rest of the world is lumped together, we find that the contributions in pure science coming out of our research institutions compare unfavorably in number with the total reported in the scientific journals devoted to the fundamental sciences.

"When we consider advances in applied and industrial research, the opposite is true—America is in a most enviable position."

The principal reason for this phenomenon is the inadequate money return received by workers in pure science, according to the journal, which rejects as only partly true the common explanation "that it is wholly a matter of temperament, that Americans are more practical minded, seek immediate and tangible results, are more gadget-conscious, and certainly more interested in the profit motive."

Unless effort in pure science receives just rewards, it is asserted, "the future of the country is dark and uncertain."

"America must awaken to the danger inherent in such a situation," the journal declares. "Unless quick progress is registered in the establishment of a United Nations organization, or some such organization at the international level which guarantees the future peace of the world, research inevitably will be forced to go behind closed

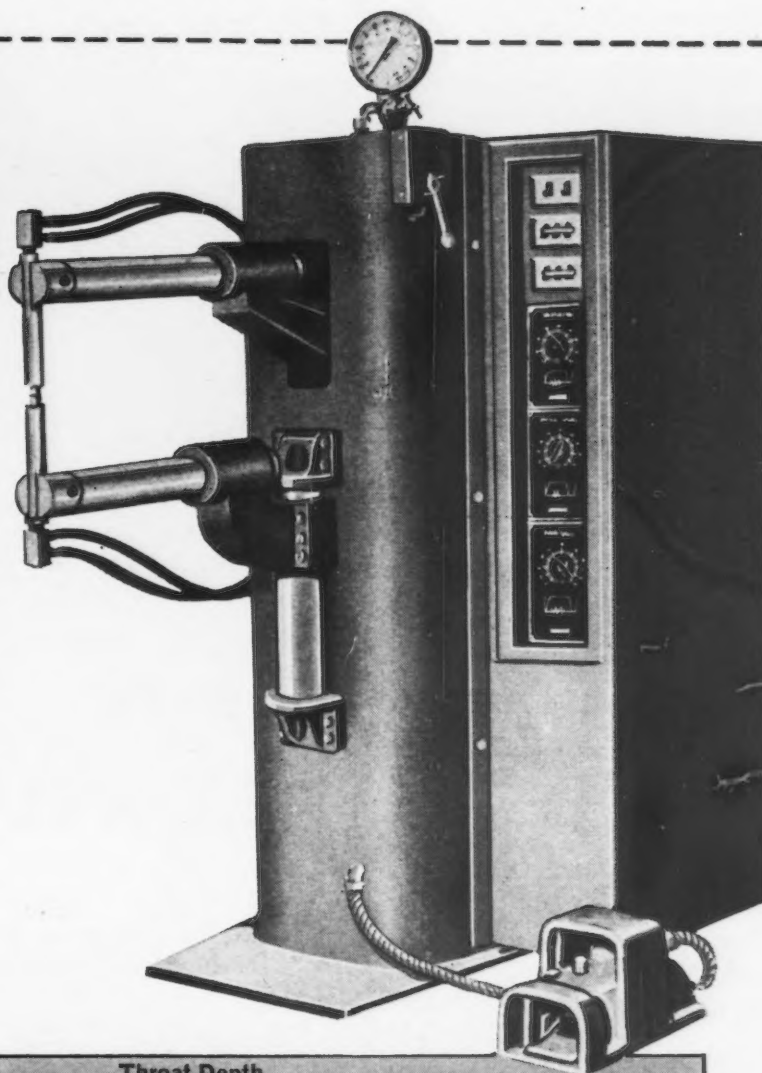
# Now Available in { 5 TRANSFORMER SIZES 5 THROAT DEPTHS

## Series PMCRO ROCKER ARM SPOTWELDER

Popularity has demanded it! The versatility of this precision welder has been increased by providing a choice of 5 power ratings and 5 arm lengths. You can now choose a machine tailored to your fabricating problems—yet low in price.

Features usually found only on larger welders are incorporated. Operation is entirely automatic with electronic controls mounted in hinged cabinet convenient to operator. Air-operated rocker arm is provided with retraction stroke and moves on heavy duty roller bearings. Write for bulletin 112-D.

The chart below gives maximum capacities on clean, mild steel under the various KVA and throat depth conditions. Minimum weldable gauge is 28. (U. S. Standard)



Transformer Rating	Throat Depth				
	12"	18"	24"	30"	36"
20 KVA	16 Gauge	18 Gauge	19 Gauge	22 Gauge	Not Supplied
30 KVA	14 Gauge	16 Gauge	18 Gauge	19 Gauge	22 Gauge
40 KVA	13 Gauge	14 Gauge	16 Gauge	18 Gauge	19 Gauge
50 KVA	12 Gauge	13 Gauge	14 Gauge	16 Gauge	18 Gauge
75 KVA	11 Gauge	12 Gauge	13 Gauge	14 Gauge	16 Gauge

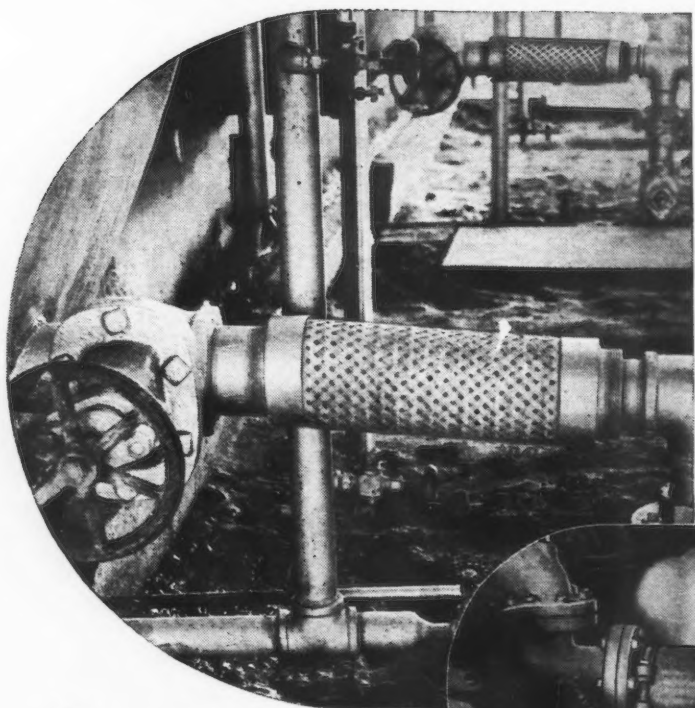
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- correcting misalignment
- connecting “hard-to-reach” inlets and outlets
- hose lines that must be frequently connected and disconnected
- temporary hookups

RW-91—made in steel and bronze—withstands temperatures to 1200° F and burst pressures to 2700 p.s.i.—depending on I.D. In addition, it's leakproof and is available with helical or annular corrugations, beamed braid or braided braid. Helical sizes range from  $\frac{3}{16}$ " to 4" I.D.—annular sizes from  $\frac{5}{32}$ " to 2" I.D. REX-WELD, RW-91 is ready to go to work for you now! Ask for Bulletin E-144.

Flexible Metal Hose for Every Industrial Use



**CHICAGO METAL HOSE CORPORATION**  
MAYWOOD, ILLINOIS

Plants: Maywood and Elgin, Illinois



## NEWS OF INDUSTRY

doors. In this day and age science and warfare are so intimately wedded that, unless the possibility of war is eliminated entirely, the free exchange of scientific information will be stopped abruptly by the military.

“If, unhappily, the trend of future events is in the direction of war, America will no longer have full access to the fundamental research of the scientists of other nations, but will have to depend solely upon its own efforts for the fundamental contributions that always precede development of practical applications.”

## **Export and Import Data Will Be Compiled in N.Y.**

Washington

••• Beginning Oct. 1 all compilations of exports and imports will be made in New York.

This shift from Washington will be due to the transfer of the Foreign Div. of the Bureau of the Census. Of the division's 400 employees, 200 declined to leave Washington. The resulting personnel shortage will have to be made up by recruitment in the New York area. One reason why the Washington employees refused to transfer was that they have their homes in the capital. Another reason was the fear that it would be difficult to find living quarters in or near New York, which, like Washington, is extremely congested.

Because of a sharp slash in the appropriations, Census will have to cut out several of the releases. This is a source of complaint by interested businessmen.

This cut in funds is only a part of a much larger trimming which will make it impossible to gather important statistics that industry has been anxious to obtain. These contemplated enterprises were a complete 1946 census of manufactures to be taken in 1947 and a similar census of business. These were to have been taken simultaneously. The business census would have included retail, wholesale and service industries. The cut, amounting to \$17 million, also made it necessary to abandon a plan to take a sample census of population together with an income study. It was proposed to take up the population census and income study this fall.



# Strides in Steelmaking

## By WISCONSIN

● Two great strides in steelmaking are *Sulfite-Treated Steel*, the more machinable steel, and "*H*" Steels, alloy steels of guaranteed hardenability.

Sulfite-Treated Steel, originated and developed by Wisconsin metallurgists, has proven itself to be far more machinable than ordinary steel even after being hardened by heat-treatment. Yet its physical properties are entirely satisfactory. In every application where machinability counts, increased production and lowered costs have been the result.

"H" Steels are alloy steels produced to your "product prescription." This means that "H" Steels have a much narrower hardenability band *guaranteed*. Wisconsin has been a leader in the development of these steels and at present is the largest producer of "H" Alloy Steels.

Wisconsin's completely integrated operations from ore and coal mines to the finished steel, staffed by top-flight steelmakers, are your assurance of excellence in alloy and special steels. Our sales and metallurgical staffs are at your service.

### WISCONSIN STEEL COMPANY

(Affiliate of International Harvester Company)

180 North Michigan Avenue

Chicago 1, Illinois

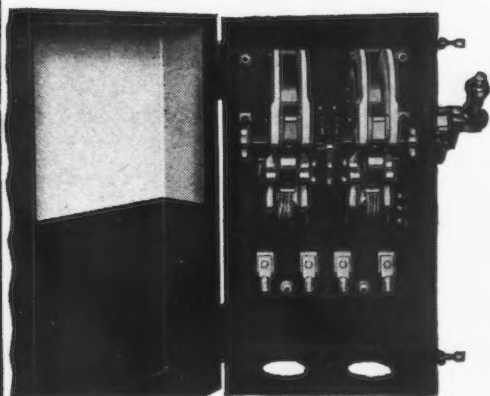
### WISCONSIN STEEL OPERATIONS

IRON ORE MINES	COAL MINES	OPEN HEARTH FURNACES
HEAT-TREATING, COLD FINISHING AND ANNEALING FACILITIES		
ROLLING MILLS	ORE FREIGHTERS	BLAST FURNACES

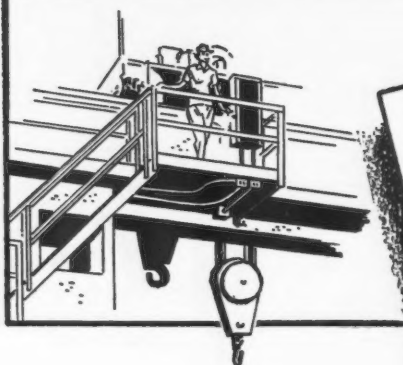


# WISCONSIN STEEL

Now--two more sizes of this  
**new** Safety Disconnect Switch  
for D-c Cranes



- 1 Manual-magnetic type for ease of operation.
- 2 LINE-ARC design for high arc-rupturing ability.
- 3 Designed with parts associated with crane control to reduce the replacement-part problem.



Safety rules in many industrial plants and laws in several states require a safety disconnect switch on overhead traveling cranes, mounted at the point where the operator enters or leaves the crane. These switches disconnect the crane from the main collector power-feeders running along the crane runway. Previously, operators, especially women, have had difficulty in opening and closing disconnect switches of the manually operated type.

This new EC&M Magnetic Type Disconnect Switch meets all the requirements of ease of operation, safety, convenience and reliability. It is of double pole design, completely enclosed and has side-type, externally-operated handle with thumb-latch which holds handle in either open or closed position.

Pushing the handle up closes the switch, pulling it down opens it—a cam roller forces contacts open, if necessary, and also insures against accidental closure due to vibration or an impact blow from another crane on the same runway. It allows for up to three padlocks for locking switch open.



New publication 1024, just issued, gives complete data on ratings, sizes, dimensions, etc. Copy will be mailed promptly upon receipt of your request.

**THE ELECTRIC CONTROLLER & MFG. CO.**  
2698 EAST 79TH STREET . . . CLEVELAND 4, OHIO

NEWS OF INDUSTRY

**Bureau of Mines  
Awards Safety Trophies  
To Mines and Quarries**

Washington

• • • The Bridgeport limestone quarry of the Bethlehem Steel Co., Bridgeport, Pa.; the Mahoning open cut iron ore mine of Pickands, Mather & Co. (Mahoning Ore & Steel Co.), Hibbing, Minn.; and the James underground iron ore mine of the James Mining Co., Iron River, Mich., were among the six mines and quarries which were awarded "Sentinels of Safety" trophies for their outstanding safety records for 1945. The awards were made in connection with the twenty-first National Safety Competition sponsored by the Bureau of Mines and were announced by Dr. R. R. Sayers, Bureau Director.

The 1945 records of these mines were:

Bridgeport quarry — worked 379,948 man hr without a lost time accident.

Mahoning ore mine—worked 367,152 man hr without a lost time accident.

James ore mine—worked 177,373 man hr without a lost time accident.

The following metal mines won certificates of honorable mention for outstanding safety records:

Calloway-Mary copper mine, Ducktown, Tenn., Tennessee Copper Co. Zimmerman iron ore mine, Gaastra, Mich., The Verona Mining Co. Midnight lead silver mine, Aspen, Colo., the Midnight Mining Co. Tobin iron ore mine, Crystal Falls, Mich., Republic Steel Corp.

The following open pit mines were operated during 1945 without a disabling injury:

Sagamore iron ore mine, River-ton, Minn.; Pickands, Mather & Co. (Sagamore Ore Mining Co.)

Corsica iron ore mine, Elcor, Minn.; Pickands, Mather & Co. (Corsica Iron Co.)

Bennett iron ore mine, Keewatin, Minn.; Pickands, Mather & Co. (Bennett Mining Co.)

Biwabik iron ore mine, Biwabik, Minn.; Pickands, Mather & Co. (Biwabik Mining Co.)

Columbia phosphate mine, Columbia, Tenn.; Monsanto Chemical Co. St. Paul iron ore mine, Keewatin, Minn.; Republic Steel Corp. Richmond iron ore mine, Palmer,

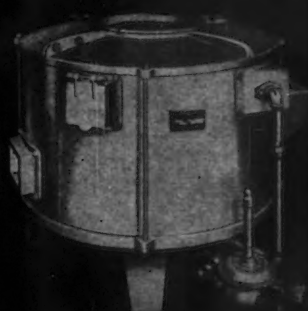
# Sunbeam STEWART

THE BEST INDUSTRIAL FURNACES MADE

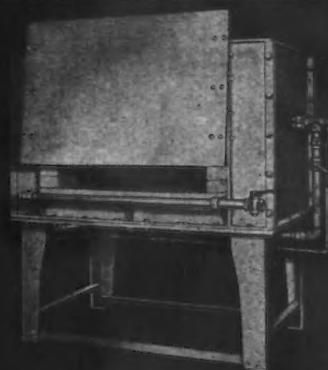
In addition to large units designed to meet specific production requirements, Sunbeam Stewart also builds these famous  
**STANDARD INDUSTRIAL FURNACES**



SEMI-MUFFLE OVEN FURNACE



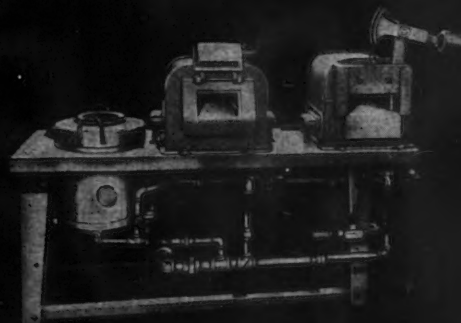
ROUND POT FURNACE



OPEN SLOT FORGE



STATIONARY METAL  
MELTING FURNACE



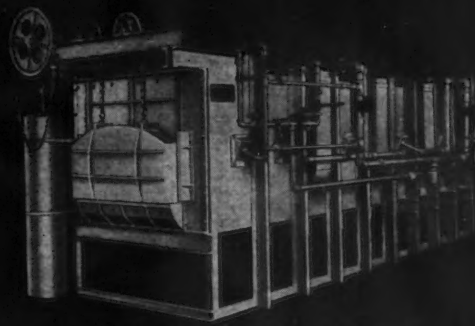
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SMALL  
FORGE



AIR DRAW  
RECIRCULATING  
FURNACE



HEAVY PORTABLE OVEN FURNACE



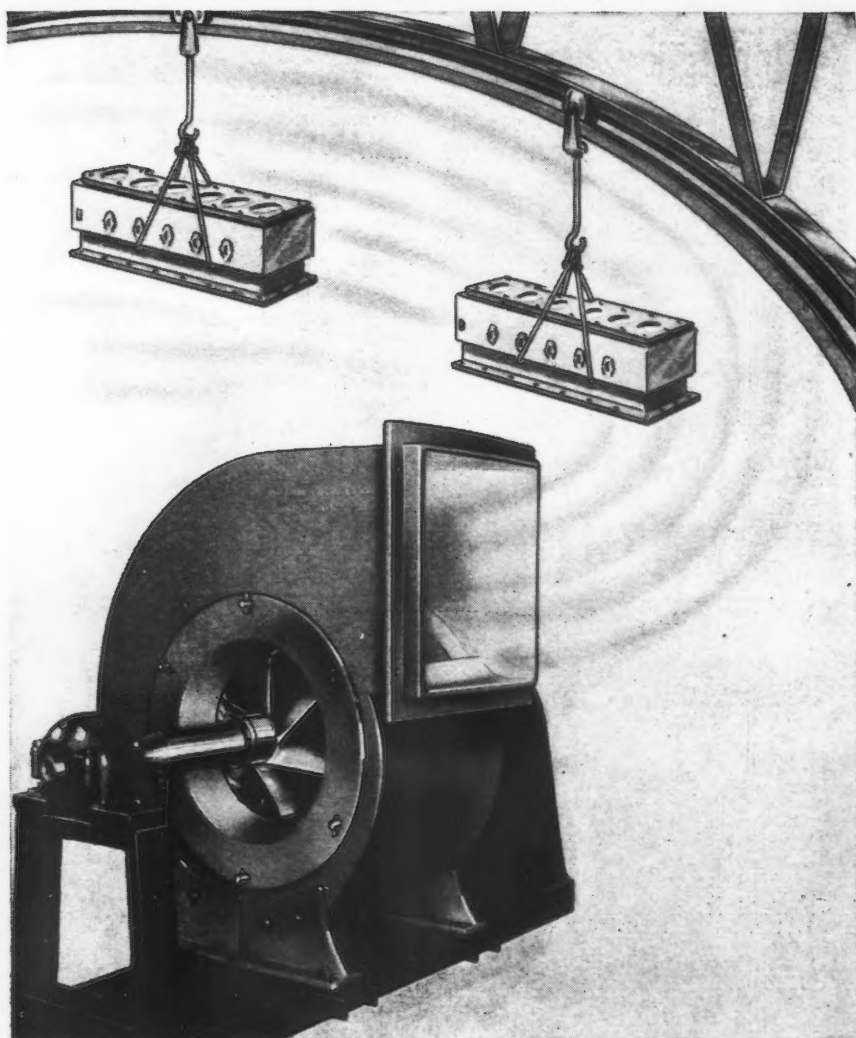
BENCH OVEN FURNACE

## SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

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A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.



## 10 FANS LIKE THIS Improve the Heat Treating of Complete Motor Blocks

In the plant of one of the country's largest producers of engine motor blocks—complete blocks are heat-treated to relieve stresses and insure the uniformity which means so much in the performance of the equipment in which these engines are eventually used.

To re-circulate the high temperature air in the closed systems through which the blocks are passed, and provide the overall uniformity of heating—10 MICHIANA High Temperature FANS have been in service for over a year in the heat-treating furnaces. Re-circulation is *the* solution to the even heat-treatment of engine blocks, sleeves and many similar cast parts and products for uniformity and control of zone. Suitable fans designed and constructed for long service under high temperature conditions are essential to successful, economical, re-circulating furnace performance.

MICHIANA long-life Fans are made of heat-resistant alloys and have no screws, bolts, rivets and welds. Vital operating parts can expand and contract independently of each other radially and axially, eliminating distortion and unbalanced conditions. A full range of sizes is available in capacities upward from approximately 400 cubic feet of air per minute. Our engineering staff can make practical recommendations.

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## NEWS OF INDUSTRY

Mich.; The M. A. Hanna Co. Harrison Group iron ore mine, Cooley, Minn.; Butler Bros. Volunteer iron ore mine, Palmer, Mich.; Palmer Mining Co.

## CPA Channels 30 WAA Surplus Housing Items Into Veterans' Projects

Washington

• • • CPA has acted to channel all of 30 listed government-owned materials into the Veterans' Emergency housing program and the construction program of the Veterans' Administration. Previously CPA's direction provided for distribution of 70 pct of nine materials for these purposes.

By an amendment to Direction 7 to PR-13, it is provided that during an initial period, to be determined by WAA, sales of listed materials may be made only to buyers who certify that they require and will incorporate the materials in a housing project authorized by FHA under the Veterans' emergency housing program or in a project under the Veterans' Administration Construction Program or that they will hold the materials for resale to such persons. During this same period sales may be made to RFC for resale to such persons, and also sales may be made to the Veterans' Administration for use in its construction program.

After the initial period, the unsold balance of any lot may be sold to other buyers in accordance with the Surplus Property Act and applicable regulations.

Among the additional building materials covered by the direction are the following:

Cast iron low-pressure boilers for residential heating use; cast iron pressure pipe and fittings; cast iron soil pipe and fittings; concrete reinforcing bars and mesh; floor furnaces; furnace pipe, fittings, and duct work; nails, all types and sizes (except 3d to 6d, cement and bright, box and common); prefabricated panels; prefabricated sections; screwed pipe fittings (gray cast recessed drainage 2 in. and under, gray cast steam fittings 3 in. and under, malleable fittings including unions 2 in. and under); sinks; steel registers and grills; farm air furnaces; water closets.

# Information Free

## (1) Materials Handling:

Outline of general principles which govern installations of any materials handling system is covered in Bulletin 100-7-45-5M. Below the hook devices, ceiling fittings, T-rail and beamrail sections, tramrail shielded electrification design, tramrail switches and tramrail standard yoke assembly are all described with accompanying cutaway sketches. *Forker Corp.*

## (2) Power and Hand Wrenches:

Production wrench equipment for all industrial purposes are listed in catalog 45-P, with specifications and illustration of the many types and styles. Conversion and drill size tables, as well as price lists are included. *Snap-on Tools Corp.*

## (3) Shot Peening:

How shot peening increases fatigue life of metals is presented in a booklet, which covers the application of shot peening to modern production requirements. Drawings, charts and photographic reproductions illustrate the subject. Performance data on the practical use of this method in the metalworking field is included. *Pangborn Corp.*

## (4) Aluminum Alloys:

A series of aluminum-magnesium-zinc alloys possessing high elastic properties are described in illustrated bulletin. Information on the aging characteristics, mechanical and physical properties as sand cast and chill cast, and chemical compositions of these Ternalloys enables foundrymen and designers to evaluate them for their products. *National Smelting Co.*

## (5) Protective Coating:

The complete story of how Prufcoat provides positive protection against acids, alkalis, oil and water for all surfaces is told in illustrated pamphlet. Case histories and full directions for Prufcoating concrete, structural steel, floors, pipes, tanks, machinery and other equipment are given. *Prufcoat Laboratories, Inc.*

## (6) Battery Chargers:

Illustrated Bulletin 206 outlines in detail operation of the motor-generator in automatically charging lift-truck motors. This single-circuit, 3-phase battery charger requires only eight to nine hours for complete charge. *Electric Products Co.*

## (7) Mobile Machine Shop:

How the custom built machine shop can be equipped in accordance with individual requirements is emphasized in illustrated folder. Time, labor and transportation expense savings are detailed,

particularly for concerns, such as contractors, oil companies, utilities, railways, airports, operating over extensive areas. *Davey Compressor Co.*

## (8) Ovens:

Construction and operation data on core and mold ovens, featuring recirculating air heaters, oil or gas fired, are presented in Bulletin 141, together with installation pictures. Also included are continuous conveyor type core and mold ovens and continuous monorail type core ovens. *Carl-Mayer Corp.*

## (9) Materials Handling:

Turner system of materials handling, based on standardized interchangeable and interlocking units, is outlined in booklet. Units in the system are described and illustrated by groups, which include transport, jummy, bin sections and section trays, stacking boxes, slide and lift shelf trays, pallets and platforms, superstructures, folding stakes, etc. *Factory Service Co.*

## (10) Pneumatic Conveying:

Descriptive bulletin No. 143, section 3, presents characteristics of the Spencer vacuum equipment, portable and stationary, for pneumatic conveying of charcoal, metals, chemicals, minerals, coal dust, sand, etc., at up to 5 ton per hr. with line drawings of the machine and equipment. Photographs show special applications for vacuum. *Spencer Turbine Co.*

## (11) Tubing Specialties:

Folder lists and briefly describes tubing specialties, including special accuracy tubing made to extra close tolerances; heat treated alloy tubing; light wall tubing with thicknesses as light as 1 pct of the OD; capillary tubing with ID's as small as 0.004 in.; seamless tubing of small bore and heavy wall for oil and diesel engines. *Sumner Tubing Co.*

## (12) Plating Tank Rheostats:

Construction features of cast grid type tank rheostats, from 15 to 5000 amp and 1 to 6 v drops, for electroplating control are described in folder. Illustrations show various capacity models. *Columbia Electric Mfg. Co.*

## (13) Wire Rope Conservation:

Resumes of a series of illustrated bulletins on how to get the most out of wire rope are compiled in pamphlet. Sheave materials, correct rope reeving, regular inspection, lubrication, corrosion protection, preforming, are a few of the individual bulletin subjects. *MacWhyte Co.*

## (14) Quick Fasteners:

Engineering and procurement data of the new Q-Two quick-operating fastener

for removable and hinged panels are contained in bulletin No. 8-75. Its advantages to general industrial users are presented, with installation instructions, parts data and many illustrations. *Shakeproof, Inc.*

## (15) Single Point Tools:

Bulletin 101-TS contains price and dimension tables for the company's standard line of carbide tipped, Meehanite single point tools for turning, facing, cut-off and roller turner operations. *Cooper-Bessemer Corp.*

## (16) Baling Presses:

Description of the triple-compression scrap metal balers is covered in bulletin 36 TC, with illustrations showing the operating units of the machine. With these balers bulky scrap such as large industrial stampings and clippings, old automobile bodies, steel drums, can be compressed from three sides without preliminary cutting or preparation. *Galland-Henning Mfg. Co.*

## (17) Pyrometer Supplies:

Information on how to order thermocouples, protecting tubes, thermocouple wire, lead wire, insulators, etc., is presented in clear and concise manner in booklet No. 100-1. Complete descriptions and prices on various types of standard thermocouples for applications in all industries are contained in this buyers' guide. *Brown Instrument Co.*

## (18) Phosphate Coating:

Folder describes the performance of Thermol-Granodine in promoting resistance to corrosion and wear, preventing scoring and galling, and providing a base for paint, on ferrous metal surfaces. Other ACP products with brief descriptions are listed. *American Chemical Paint Co.*

## (19) Circuit Control Pump:

Operating principles, features, and applications of the hydraulic "circuit control" pump are described and illustrated in bulletin which also shows how feed, traverse and directional control are obtained with one compact unit. Engineering data and line drawings of various models are included. *Sundstrand Machine Tool Co.*

## (20) Induction Motors:

Construction features of single phase, constant speed, fractional horsepower motors, with keyed illustrations are outlined in folder. Sizes and applications of the normal purpose motor for fans, blowers, small machine tools, and the general purpose heavy duty type, are given. Dimensions and performance characteristics are also included. *Jack & Heints Precision Industries, Inc.*

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## INFORMATION FREE (Continued)

### (21) Dust Arrestors:

Bulletin DA-7 describes oval bag dust arrestors which feature patented filtering bags combining the advantages of the envelope and cylindrical types. A section of bulletin is devoted to the small unit arrestor used where a restricted amount of air is handled, and blast cleaning suction cabinets used for attaining surface finishes on delicate objects. *Parsons Engineering Corp.*

### (22) Rivets:

Tubular, split and compression rivets are featured in catalog No. 45R, which also gives price information. Suggestions for selecting the right rivet and data on proper rivet setting are offered. Catalogs on automatic rivet setting machines and machine screws are also available. *Milford Rivet & Machine Co.*

### (23) Plastics Finishing:

Plastics are treated from the sanding angle in booklet which explains abrasive selection, machinery and equipment for buffing, polishing, etc. An introduction and simplifications of the plastics themselves are included, with an enlarged chart listing the names, properties, uses and sanding practices covering 70 rigid-type plastics. *Behr Manning Corp.*

### (24) Foundry Handbook:

Bulletin FX-140 is a revised enlarged edition of "Useful Information for Foundrymen." Tables, data and general information pertaining to various foundry operations are bound into this handy pocket-size book. *Whiting Corp.*

### (25) Metal-Cutting Shears:

Three outstanding features — pivot blades, easy knife adjustment and counteracting shear pressure — are set forth in catalog No. 2011A, together with other advantages of Steelweld pivoted-blade shears. Illustration of the parts clarify the procedure of making shearing easier, faster and more accurate with these power shears. Table gives clearance dimensions and specifications. *Cleveland Crane & Engineering Co.*

### (26) Planers:

Openside, double housing and convertible planers for rapid production, rigidity and accuracy of work are the machines described and illustrated in catalog No. 157. Special features of design and performance are explained, with photographs showing use of the planers on various typical jobs. Tables give specifications. *Liberty Planers, Inc.*

### (27) Valves:

Booklet gives specifications and prices on globe, angle and check valves. Feature of the valves is a special stainless steel or S Monel metal seat and disk, which is highly resistant to erosion. *Ohio Injector Co.*

### (28) Molding Machines:

Illustrations and specifications of various molding machines for steel, malleable grey iron, brass and aluminum foundries are presented in pamphlet. Portable and stationary jolt squeezer, jolt roll-over pattern draw, and jolt stripping plate machines are a few of the types included. *Johnston & Jennings Co.*

### (29) Sandcutter:

Pertinent specifications and dimensions on the Model AM sandcutter are presented in catalog No. 25A. Photographs show the construction and operation of the machine. Brief descriptions of other models in the line are included in the catalog. *American Foundry Equipment Co.*

### (30) Second-Operation Unit:

New model high speed precision second-operation machine described in bulletin DSM 59, features preloaded ball bearing headstock and turret, dovetail bed ways, built-in electrical equipment, double tool cross slide and welded steel pedestal. Illustrations show designs of the units. *Hardinge Brothers, Inc.*

### (31) Electric Welding:

Tools and fittings required on a cable, both electrode and ground, to mechanically hold and electrically transmit welding energy from welding machines to the point of deposition are described in the 1946 Tweco catalog. Illustrations and a price and parts list covering holders, clamps, cable connectors and many other Tweco products are included in the booklet. *Tweco Products Co.*

### (32) Mold Shakeout:

Bulletin No. 124-F describes and illustrates the portable Floatex shakeout, equipped with automatic flask loader, a unit which lifts flasks off the foundry floor, deposits them on the receiving table, turns them upside down, shakes out the sand and discharges the castings, all in one series of operations. *Robins Conveyors, Inc.*

### (33) Flame Hardening:

Design and use of flame hardening apparatus from simple water-cooled torches and tips for hardening small parts to complete apparatus for use on large jobs are described in catalog No. 90. Equipment for gear hardening and hardening of both internal and external rounds as well as flat surface hardening, and a variety of manifolds, regulators, valves and seals are listed. *Air Reduction Sales Co.*

### (34) Rack Coating:

General instructions for use of Microtex air-dry rack coating, a plating rack insulator, and for use in all plating, anodizing, parkerizing and bonderizing operations are outlined in leaflet. Dipping, brushing and spraying methods of application are described, as well as drying, repairing and patching procedures. *Michigan Chrome & Chemical Co.*

### (35) Boring Machine Equipment:

Information in a 48-page book tells how, when and where to use attachments and accessories for handling standard and complex jobs on horizontal boring machines. Descriptive details are given on boring bars, boring heads and tools, clamping accessories, holding attachments, milling attachments, etc. Illustrations of the individual units are shown. *Giddings & Lewis Machine Tool Co.*

### (36) Drill Jig:

Brief description of the company's

standard and Mijit drill jigs, designed to cut the loading and unloading time to a few seconds in drilling, reaming and boring operations, is contained in folder. Applications are discussed. *Esco Engineering Corp.*

### (37) Heat Treatment:

Discussion of fundamentals of heat treatment is contained in a 54-p. booklet which is illustrated with clearly explained charts, diagrams and photographs. Factors concerning hardness, heating, pearlite, bainite, hardenability and quenching, etc., as well as factors of toughness. Table of Jominy end-quench distance v bar diameter concludes booklet. *U. S. Steel Corp.*

### (38) Car Bottom Furnaces:

Car type and elevator type heat treating furnaces are illustrated and described in bulletin No. 422. These gas or oil-fired or electrically heated furnaces are used for stress relieving welded steel structures, annealing, drawing or heating large and irregularly shaped pressure vessels, forgings, sheets, etc. Line drawings show typical arrangement of chambers and working openings in car type furnaces. *W. S. Rockwell Co.*

### (39) Hand Screw Machine:

Catalog gives detailed description of the hand screw machine, models 5 and 7, which was designed for second operation work, or work which can be chucked individually. Eight successive operations can be performed at one chucking. Units of the machine and equipment are presented in detail and illustrated. Specifications of the two models are included. *Wade Tool Co.*

### (40) Guide to Electronics:

Suggestions on how plant management can put electronics to work are given in a booklet, "The Business Man's Guide to Electronics." The six fundamental functions of electronic tubes, rectifying, amplifying, generating, controlling, counting and sorting, and inspecting, are explained and descriptions of tubes required for each function are included. Among the applications described are induction and dielectric heating for tinplating and brazing; power conversion in mills, mines, factories and railroads; measuring and inspecting. *Lamp Div., Westinghouse Electric Corp.*

### (41) Celanese Plastics:

An illustrated handbook for the layman, as well as the expert, on injection and extrusion molding of Lumarith thermoplastics presents a study of the range of properties and the variety of formulations possible with these celanese plastics. Tests by ASTM methods are described with graphs and sketches for clarification. *Celanese Plastics Corp.*

### (42) Dividing Machines:

Precision and production machines for rapid automatic ruling of linear scales in either the inch or metric system are described in bulletin 153-64. Common line patterns are illustrated and a table lists the variety of spacings obtainable. Detailed specifications are included. *Gaertner Scientific Corp.*

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(Sec. 510 P. L. & E.)  
New York, N. Y.

# wheelabrator

## A NIAGARA of CLEANING POWER!

**Perfectly controlled to give you faster,  
more economical cleaning production**

Speed cleaning at low cost results from the flood of abrasive that pours in a constant torrent from the spinning wheel of an Airless Wheelabrator . . . impacts from more than a quarter-million particles of abrasive per second or 300 pounds of abrasive per minute.

In terms of airblasting it would take approximately five  $\frac{3}{8}$ " nozzles operating under an air pressure of 90# P. S. I. and utilizing up to 225 H. P. to equal the foregoing accomplishment of a standard Wheelabrator requiring only 15 H. P.

The blast stream of the Wheelabrator is under perfect control and the full impact of its power is uniformly concentrated upon the job, scouring sand and scale from every pocket, recess, and fissure. Unlike airblasting there are no variations in pressure, velocity or abrasive volume to alter cleaning efficiency and production speeds. Wheelabrating can be timed practically to the second.

Savings result from reduced costs of labor, power, space, machining and grinding, cutting tools, inspection, etc., as reflected in the following statements of users:

### WHEELABRATOR SAVINGS TOLD BY USERS\*

- |  |                               |
|--|-------------------------------|
| "Reduced cleaning time approximately 50%."           | (Malleable Foundry)           |
| "Reduced direct labor costs 50%."                    | (Automotive Mfr.)             |
| "Saved 300 cubic feet of air per minute."            | (Malleable Foundry)           |
| "5 hours' cleaning time reduced to 15 minutes."      | (Michigan Mfr.)               |
| "Our electric bills have been cut almost in half."   | (Gray Iron Foundry)           |
| "Cleaning now with four less operators."             | (Gray Iron Foundry)           |
| "Time cut from 24 hours to 8 hours."                 | (A Connecticut Steel Foundry) |
| "Decided increase in tool life between grinds."      | (Prominent Tool Mfr.)         |
| "Replaced 14 tumblers, saving considerable space."   | (Canadian Mfr.)               |
| "18 hours' cleaning time reduced to 3 hours."        | (Brass Foundry)               |
| "Machinability much improved over tumbled castings." | (Gray Iron Foundry)           |

\* Names of users supplied upon request.

### WHEELABRATOR TUMBLASTS

Tumblasts are made in eight sizes, having capacities of 1 to 63 cu. ft. for handling loads ranging from less than a hundred pounds to several tons, and for cleaning individual parts weighing from a fraction of an ounce up to hundreds of pounds each.

### TABLES

Tables are used for cleaning flat or fragile work that is not adapted to tumbling. Built in three types: The *Multi-Table* is recommended for work having high vertical edges or intricate recesses and cavities. The *Plain Table* is especially suitable for work having few pockets and vertical edges, such as furnace castings. The *Swing Table* is an ideal general purpose machine for handling a wide range of large and small pieces.

### SPECIAL CABINETS

Cabinets are specially designed and engineered for handling work where special production problems prevail or where the work, due to size, shape or weight, cannot be adapted to a standard machine.



**American**  
FOUNDRY EQUIPMENT CO.

510 S. Byrkit St., Mishawaka, Indiana



WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

# R-C dual-ability

means better blower performance



R-C Centrifugal Blowers may be driven by steam turbine or direct connected motor—which ever is best fitted to the installation.



R-C Centrifugal Blowers are available in a multitude of sizes of single or multi-stage design, in capacities up to whatever your needs may be.



Where the rotary positive displacement type is better adapted to your needs, no other company can meet the standards set up by R-C equipment... the leader in the field for almost a century.

You'll get profitable service from Roots-Connersville Centrifugal Blowers and Exhausters because:

1. Our engineers study your needs in detail before selecting type, speed, drive, number of stages, style of impellers, etc., to insure the unit best adapted to your special requirements.
2. Our plant builds the units with scrupulous care, to close tolerances, with fine machining and finish of the materials best fitted for the work. They check every part, and the final assembly is subjected to rigid tests, before shipment.

Proof of the practical value of this R-C *dual-ability* is found in the many installations of our Centrifugal Blowers and Exhausters. They're being successfully and profitably used in almost every industry. They live up to their guarantees and have unfailingly given excellent performance.

*For better blower performance, you can depend on us.*

**ROOTS-CONNERSVILLE BLOWER CORP.**

One of the Dresser Industries  
607 Ohio Avenue, Connersville, Indiana



**CENTRIFUGAL BLOWERS & EXHAUSTERS**

ROTARY POSITIVE AND CENTRIFUGAL BLOWERS • EXHAUSTERS • BOOSTERS  
LIQUID AND VACUUM PUMPS • METERS • INERT GAS GENERATORS

## NEWS OF INDUSTRY

### Army Ordnance Reveals Development of Semi-Armor Piercing Bomb

Washington

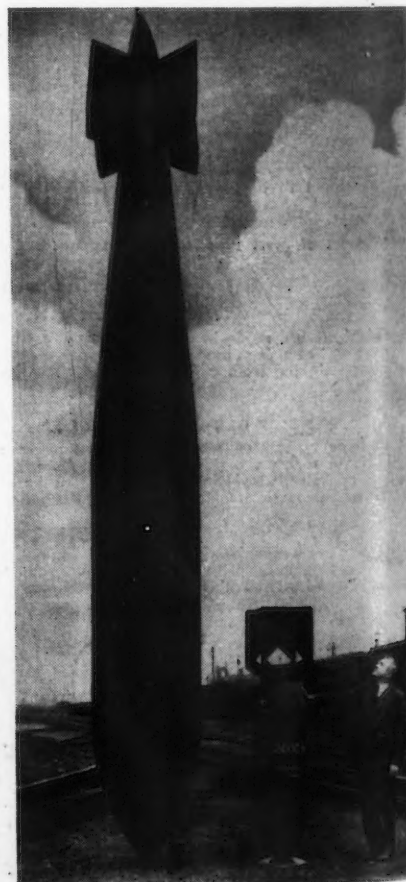
... Army Ordnance has revealed the development of a new 22,000-lb semi-armor piercing (SAP) bomb, designed to penetrate reinforced concrete before detonating.

Nicknamed "Amazon," the bomb was made by the A. O. Smith Corp., Milwaukee, from massive forgings. New techniques were developed for the manufacturing job because of its unusual characteristics.

The walls are of exceptionally thick steel to allow penetration of reinforced concrete such as is found in the German U-boat pens in France and Germany. Tests conducted during the past spring by Army Air Forces and the RAF using standard bombs have not proved entirely satisfactory.

"Amazon" was designed for just

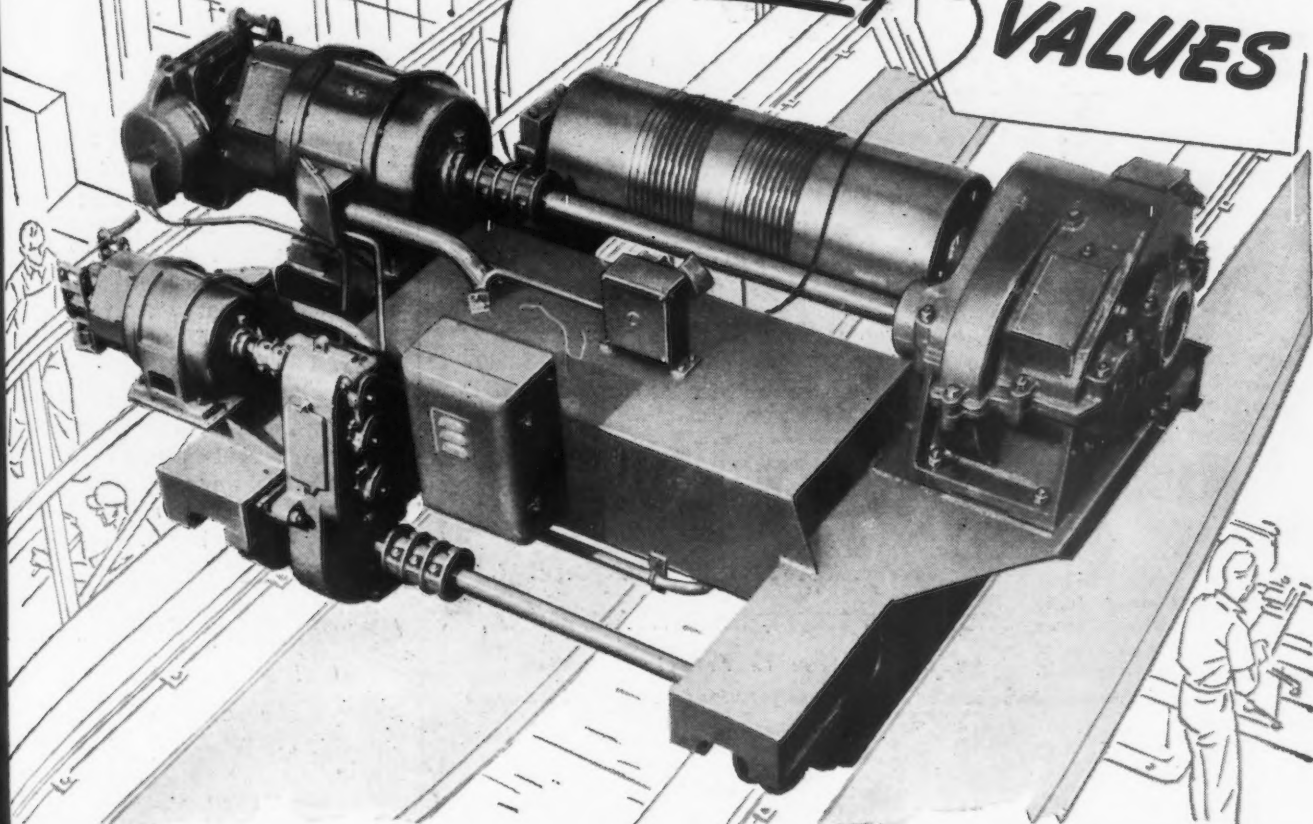
**ARMOR BUSTER:** "Amazon" is the amazing name of Army Ordnance's new 22,000-lb semi-armor piercing bomb. Mr. B. Fuller, vice-president, A. O. Smith Co., stands beside a standard 2,000 lb SAP bomb.



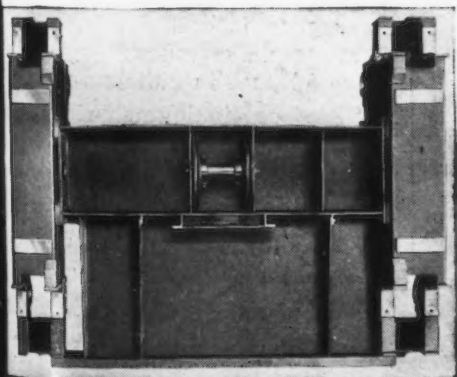
# P&H CRANE TROLLEYS

*have many*

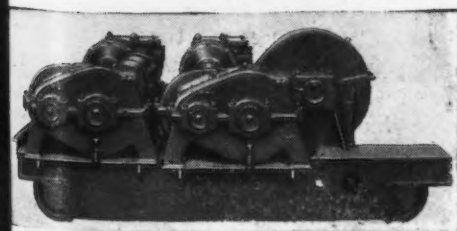
**ADDED  
VALUES**



**They maintain alignment under most severe operation!**



Underside of trolley frame, showing rigid, one-piece construction.



Note the simple mountings of compact, oil-tight gear cases in this P&H trolley view.

With P&H Crane Trolleys you can lift capacity loads at top speeds year after year . . . and never worry about trolley alignment. In P&H's simple, husky, all-welded construction, load girts are welded to box-type end trucks and the whole frame as a unit is accurately machined. This provides perfect alignment and permanent rigidity, which in turn eliminates gearing, shaft and bearing troubles. Other notable advantages built into P&H trolleys include:

**A 3-REDUCTION GEAR CASE**, mounted on the trolley side, provides oil-tight flood lubrication.

**GEARS AND PINIONS HEAT-TREATED** to as high as 302 Brinell for shockproof strength and extra wear.

**MCB TROLLEY TRUCK AXLES** with forged steel wheels insure more dependable service.

Whatever your requirements for overhead crane service, consult P&H . . . America's leading builders.

**P & H**

**HARNISCHFEGER**

CORPORATION

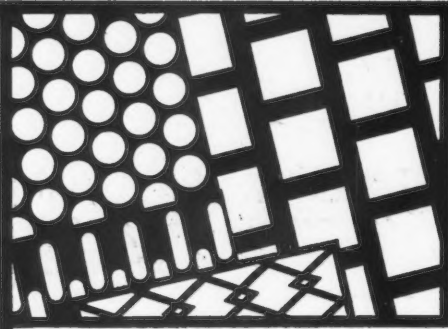
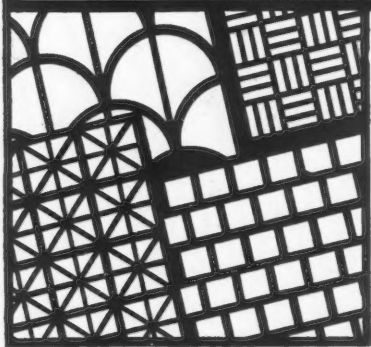
**ELECTRIC  
OVERHEAD CRANES**

4401 W. National Avenue  
Milwaukee 14, Wisconsin

GRIDS • WELDING ELECTRODES • MOTORS **P&H** EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

## PERFORATED METALS

for every industrial use



Hendrick offers a complete line of perforated metals for every type of application, in all commercially rolled metals, any gauge or size of opening. More than 70 years experience in perforating metals, extensive plant facilities and large stock of dies and tools assure outstanding performance and long service life. May we quote you?



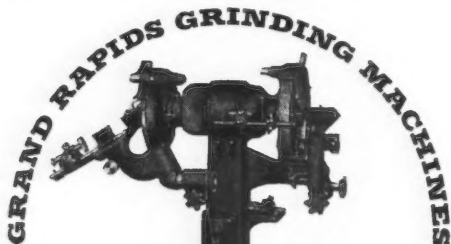
# HENDRICK

Perforated Metals  
Perforated Metal Screens  
Architectural Grilles  
Mitco Open Steel Flooring,  
"Shur-Site" Treads and  
Amorgrids.

*Manufacturing Company*

37 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities



No. 10-B  
Tap & Drill Grinder

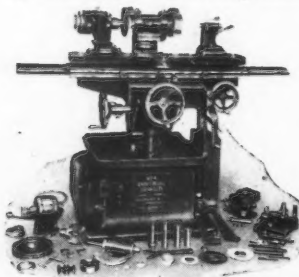
With the Combination Tap and Drill Grinder you save three ways: 1. First cost, 2. Maintenance expense, 3. Valuable floor space.

Grand Rapids No. 4 Universal Cutter and Tool Grinder handles complex tool grinding jobs with maximum speed and convenience. Write for bulletins 1045 and GL 9-15-44.



## DELIVER TOP TOOL ROOM EFFICIENCY

Whether you need a Universal Cutter and Tool Grinder or a Combination Tap and Drill Grinder, you can be sure of top tool room efficiency if they're Grand Rapids by Gallmeyer & Livingston.



No. 4 Universal Cutter & Grinder

### What "GRAND RAPIDS" Quality Means: Gallmeyer & Livingston

cast their close-grained gray iron, machine to micrometric tolerances, precision-assemble grinding machinery of unsurpassed performance. *Grand Rapids* means top quality in grinding machinery.

GALLMEYER & LIVINGSTON COMPANY, 200 STRAIGHT ST., S. W., GRAND RAPIDS 4, MICH.

## NEWS OF INDUSTRY

such targets as these, some of which have concrete roofs up to 30 ft in thickness.

Sixteen of these monster bombs have been shipped to England for tests against the submarine pens at Farge, Germany, this summer. They are expected to penetrate at least 16 ft of concrete before exploding. The result expected is that the roof of the pen will be blown open.

The AAF has modified the bombs of several B-29's to allow them to carry "Amazon" to heights of 20,000 ft and higher. Its long streamlined shape and airfoil fins will allow "Amazon" to reach higher terminal velocity than any other bomb.

It is called a semi-armor piercing bomb since it is to be used against resistant targets such as reinforced concrete buildings and factories and is not constructed as heavily as an armor piercing bomb.

## Says Building Cost Advance

Cleveland

... Basic cost of industrial buildings advanced 11 points to 147 during the second quarter of 1946, representing the largest percentage advance in any one period since the third quarter of 1940, according to the Austin Co. index.

George A. Bryant, Austin Co. president, said the large number of wage and price increases which have gone into effect since April 1 are mainly responsible for the large advance in building costs.

"The continuing shortages of construction labor and materials make it virtually impossible to schedule work on anything like a normal basis," Mr. Bryant said. "Unless the owner is willing to authorize the expenditure of time and money for recruiting and expediting, construction schedules frequently have to be stretched out to a point which increases job overhead anywhere from 25 to 50 pct above normal.

"At the same time, we are encouraged by the promptness with which OPA officials are acting on industrial construction applications and by the cooperation of material and equipment manufacturers who are putting all the resources at their command behind production with real results."

## Cites Right and Wrong Way to Carry on Trade With S.A. Markets

New York

••• Do's and Don'ts for U. S. manufacturers interested in entering and competing successfully in the fertile Latin American market as outlined by David Lindquist in "Exporter's Primer," an article appearing in the July issue of the *Inter-American* magazine are as follows:

### Don'ts

- (1) Don't fail to learn Spanish and Portuguese.
- (2) Don't hire an interpreter unless absolutely necessary. If you must—make sure he knows the technicalities of your business and product.
- (3) Don't tie in with an export agent who handles too many lines, or whose lines widely differ from yours.
- (4) Don't be impressed with an export agent just because he has many offices throughout Latin America. Many offices mean many lines—but not necessarily a good selling job for you.
- (5) Don't give representation of your line to a Latin American citizen you haven't investigated. He may need business because he's disliked by his compatriots. In any event, his political background should also be investigated, particularly if the city, state or federal governments are your potential customers.
- (6) Don't go to Latin America yourself unless you like the people and the places or think you will like them. Latinos are sensitive to American "hurry-up" because of a desire to get back home.
- (7) Don't hire a European to push your North American product.
- (8) Don't fail to educate your customers in the correct use of your product. The manufacturer is blamed for poor results when a product is used for purposes for which it was never intended.
- (9) Don't permit Latino importers to sell your product at inflationary prices. This can

# Rely On ROSS

## handle materials in BIG LOADS

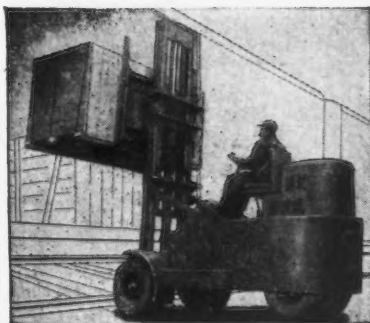
## ... reduce HANDLING COSTS

It's axiomatic that the more pieces or pounds handled in a single load, the lower the handling-cost per individual piece or pound ... Designed and built to transport and stack heavy unit-loads, ROSS Straddle Carriers and ROSS Heavy Duty Lift Trucks are renowned for their ability to effect big savings in cost of handling a great variety of raw materials, semi-finished and finished products.

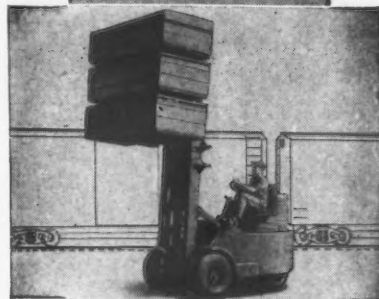
ROSS engineers will be glad to suggest practical solutions to materials-handling problems in your plant. For complete description of The ROSS System, write for colorful forty-page ROSS Book 1A-76.

### The ROSS System of STRADDLE CARRIERS and LIFT TRUCKS - CAPACITIES -

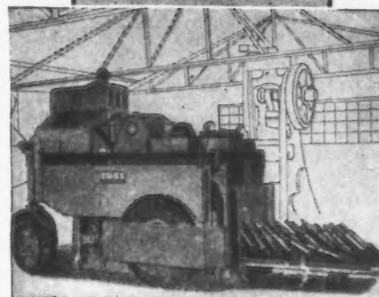
Series 90 Straddle Carrier — 20,000 to 30,000 lbs.  
Series 70 Straddle Carrier — 10,000 lbs.  
Heavy Duty Lift Trucks — 6,000 to 18,000 lbs.



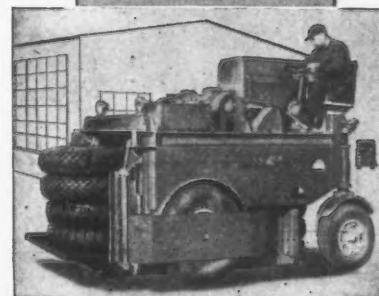
RECEIVING



PROCESSING



STORAGE



SHIPPING

The ROSS CARRIER COMPANY • 300 Miller Street, Benton Harbor, Michigan, U. S. A.

Direct Factory Branches and Distributors Throughout the United States and Canada



# Fast Tough



## Complete Range of Metal Sawing Machines

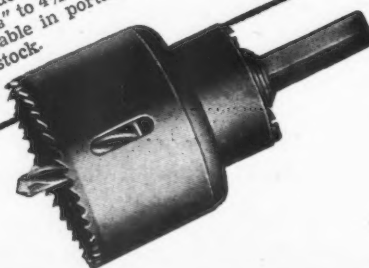
Being the largest exclusive manufacturer of metal sawing machines and blades, both hack saw and band saw type, we have the correct answer to your cut-off problems. Each MARVEL model has a distinct application, so write us and we will send our catalog, price, and recommendation for the saw to fill your requirements most efficiently. MARVEL sawing engineers are also available to discuss and analyze your cut-off work. (Without obligation of course)

**ARMSTRONG - BLUM MFG. CO.**  
5700 Bloomingdale Ave., Chicago 39, Illinois, U.S.A.

Heavy feed at high speed spells doom to the ordinary hack saw blade; down-time for your machine, extra expense in money, man hours, and production. The MARVEL Hack Saw Blade, because it is positively unbreakable under these conditions, should be "a must" tool in every efficiently operated shop. A tough alloy steel back is electrically welded to high speed steel teeth, producing a blade that can be pulled to almost unlimited tension; can withstand extra heavy feeds and the heat and abrasion of high speed heavy duty sawing.

The same exclusive unbreakable feature of MARVEL Hack Saw Blades is also a feature of MARVEL Hole Saws, giving these saws the ability to stand up under abuse. MARVEL Hole Saws cut holes from  $\frac{3}{8}$ " to  $4\frac{1}{2}$ " diameter in stock up to  $1\frac{1}{8}$ " thick. Usable in portable drill, drill press, or lathe tail stock.

*Heavy feed  
at  
high speed!*



## NEWS OF INDUSTRY

cause permanent damage to the goodwill you need.

### Do's

- (1) Do set up your own export department and hire an experienced technician; send him to Latin America to become acquainted with present prospects and find new ones.
- (2) Do pay such a man well and guarantee his expenses. Investigate him thoroughly first and then place complete trust in him.
- (3) Do work through an American export house when your product fits in well with those already carried by the firm, and so take advantage of a tested prospect list.
- (4) Do investigate your export-agent-candidate thoroughly. Many of those set up in American port cities ruthlessly exploit both Latin American buyers and U. S. manufacturers.
- (5) Do consider forming an export organization with other non-competitive manufacturers if you cannot afford a full-fledged department of your own. Your firm will then sell to the export company which charges a small commission to pay expenses. Representatives are trained to handle the business of all and each member firm takes an equal part in the management of the export company.
- (6) Do grant exclusive export representation to another manufacturer who already maintains an active export organization for a product or products which complement yours. This means that the manufacturer's representatives will frequently be able to pull in more business on his own product because he can sell your supplementary or complementary products with his and vice-versa.
- (7) Do give thought to credit extension. Europeans in Latin America are said to be much more generous in this respect than North Americans.
- (8) Do consider the rising standard of living in Latin American countries and

# ERIE BUCKETS



**THE COMPLETE LINE**

**General Purpose  
Dredging and Hard  
Digging  
Dragline  
Material Handlers  
Hook-on Type  
Ore Handling  
Coal and Coke  
4-Rope  
Barge Type  
Strayer Electric**

*Above types built in weights and capacities to suit your crane and job requirements.*

*Write for Data*

867 GEIST ROAD

**ERIE STEEL CONSTRUCTION CO.**  
ERIE, PENNSYLVANIA

*Aggre Meters • Buckets • Concrete Plants • Traveling Cranes*

## NEWS OF INDUSTRY

what an infant export business will mean to you in the long run—if properly inaugurated now.

- (9) Do keep the friendship and respect of Latinos with whom you do business. This is good public relations—and we have need of much more of it with our Latin American neighbors.

### Lukens Sales \$7.8 Million

Coatesville

••• Consolidated net sales of Lukens Steel Co. and subsidiaries, for the third quarter of their 1946 fiscal year, ended June 15, 1946, amounted to \$7,866,535.54. For the three quarters of their current fiscal year, net sales of the companies were \$18,361,729.88.

The consolidated net profit of the companies for the third quarter of the 1946 fiscal year was \$171,297.12. Included in the costs of this quarter were strike and other shutdown expenses of \$127,881.72. For the first three quarters of their current fiscal year, the companies suffered a consolidated net loss of \$1,455,188.66, before estimated tax recoveries due to carry-back provisions of the Internal Revenue Code. Of this loss, \$1,107,044, 45 resulted from reduced operations due to the steel, coal and rail strikes which occurred during this period.

### New Surplus Guide Book

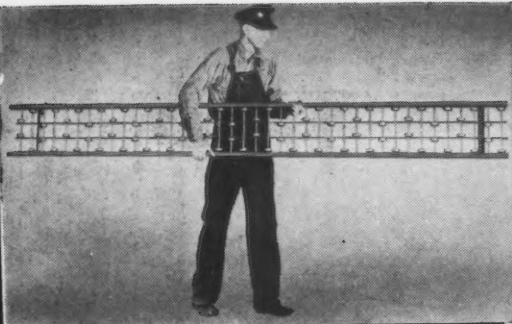
Washington

••• "How, What, and Where" to buy surplus property is graphically explained in a 32-page illustrated booklet issued by the War Assets Administration.

Available at the Washington and regional WAA offices, and at post offices throughout the country, the booklet is a handy guide for prospective buyers of surplus property of all kinds in the United States and its territories and possessions.

The priorities accorded veterans and other groups are explained, and priority holders are told what they must do to take advantage of the opportunities offered them in surplus disposal. The booklet tells where to get information on sales and lists sales offices of WAA and other domestic disposal agencies with addresses and telephone numbers.

An Easy to Carry  
and Set Up  
**SECTION**



A Complete  
Continuous Flow  
**SYSTEM**



A Portable  
All Purpose  
**UNIT**



**Whatever Your Need  
in Conveying Equipment, Standard  
offers any one or all three**

**W**HATEVER you have to handle — packages, parts, units,—from receiving of raw material through manufacturing or processing to storage or shipping, Standard equipment can speed operations — save time and cost.

An 8 to 10 ft. section of Standard Wheel Conveyor expedites "spot" handling — a Standard Handibelt or Handipiler portable unit stacks and piles packages easily and quickly to ceiling height or loads and unloads cars and trucks with ease and dispatch — a Standard system of power or gravity conveyors accelerates

handling — cuts the cost — at every step in manufacturing.

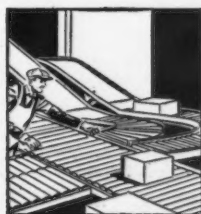
The range and versatility of Standard Conveyors have been developed in more than 40 years of service to business and industry.

Write for valuable reference book "Conveyors by Standard" Catalog No. 1A-76

**STANDARD CONVEYOR CO.**

General Offices: North St. Paul 9, Minn.  
Sales and Service in Principal Cities

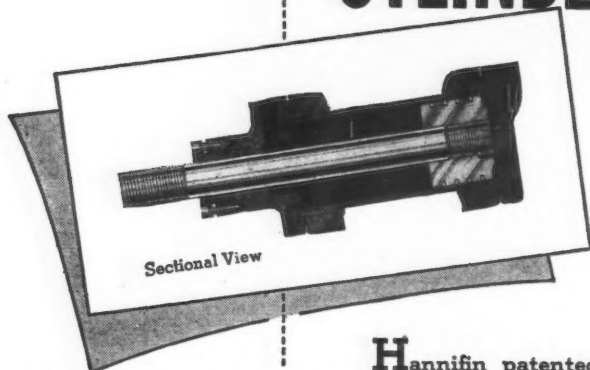
**STANDARD**  
Gravity and Power  
**CONVEYORS**



• ROLLER-BELT-SLAT-PUSHBAR CONVEYORS • PORTABLE CONVEYORS  
AND PILERS • SPIRAL CHUTES • PNEUMATIC TUBE SYSTEMS

**HANNIFIN**

# HYDRAULIC CYLINDERS



**H**annifin patented "no-tie-rod" design provides a stronger hydraulic cylinder assembly, easier to install, with simplified piping. High efficiency hydraulic cylinder operation is assured throughout a long service life.

Cylinder bodies are bored and then honed to a mirror finish, giving a cylinder bore that is straight, round, and perfectly finished. The use of piston with precision cast iron rings in this accurate cylinder bore provides a high-efficiency piston seal and long service life.

Hannifin hydraulic cylinders are furnished in a full range of sizes, for any length stroke, in seven standard mounting types. Special mountings and extra large sizes built to order. Write for hydraulic cylinder bulletin.

Hannifin Manufacturing Company, 621-631 So. Kolmar Ave., Chicago 24, Ill.

**take a breather - - - but**



*Material handling must proceed at top efficiency regardless of gas, smoke, vapors or excessive ambient temperatures.*

This Euclid Crane boasts air conditioning in the cab. The operator "takes a breather", but stays on the job, working at his physical best in clear, pure air at the desired temperature.

Standard Euclid Cranes are built in 3 to 25 ton capacities with spans from 20 to 100 feet. Larger cranes of greater capacity on order.



**THE EUCLID CRANE & HOIST COMPANY**  
1361 CHARDON ROAD • EUCLID, OHIO

**WRITE FOR CRANE CATALOG**

## NEWS OF INDUSTRY

### OWMR Report Reveals Country Now in Peak Peacetime Prosperity

Washington

• • • Release of the regular OWMR quarterly report, the seventh issued by the agency but the first since John R. Steelman became head of the agency, told the nation little that had not already been revealed in previous summaries—that the country is now enjoying its highest peacetime employment, production and consumption.

In that portion of the report devoted to production, Mr. Steelman revealed in detail the "facts and figures" which President Truman's statement declared "a good many people have been inclined to overlook." More specifically, these may be summarized briefly as follows:

**Employment:** During the first quarter of 1946, the civilian labor force averaged "several hundred thousand more" than at VJ-Day. By May, the total had reached 57.6 million of which approximately 8.9 million were engaged in agricultural pursuits. The number of unemployed was estimated to be less than 2.5 million. (Comparative figure, Sixth Report, 2.7 million unemployed).

**Income:** Total income received by individuals for the quarter was at an annual rate of \$158 billion (increase of \$1 billion over Sixth Report) of which decline in military payrolls was more than offset by climbing civilian payments which rose to an annual rate of \$97 billion from the previous reported \$92 billion.

**Production:** Index of industrial production rose from the first quarter 160 to 165 for the second; in dollar volume, the total output of civilian economy (including services) rose from an annual rate of \$167 billion to \$174 billion.

**Consumption:** Purchases and payrolls of military agencies dropped \$1 billion to \$16 billion; at the same time civilian consumer buying increased by \$2 billion to an annual rate of \$122 billion. A large share of the increase was believed to be represented in purchases by business in an effort to replenish depleted inventories.

## SKF Perfects Minute Precision Steel Balls

Philadelphia

••• Production for immediate industry use of high-precision steel balls half the size of a pinhead and four times more valuable than gold was announced recently by SKF Industries, Inc.

Richard H. DeMott, vice-president of the ball and roller bearing company, said the minute balls, 1 mm in diam, were designed especially for new-type fountain pens, but that they also will be available for delicate instrument bearing and other applications. Seven thousand weigh only an oz.

Made to extremely fine tolerances, the 1 mm balls average within 5/1,000,000 of an in. of being perfectly round and have a diameter variation of 50/1,000,000 of an in. or less.

A special process imparts a satin-like finish to the balls so as to give inks and lubricants greater surface cohesion, Mr. DeMott said. This finish, he added, consists of minute scratches on the balls which are invisible unless highly magnified.

The balls are made from high carbon and chromium wire 45/1,000 of an in. thick which is fed into machines that cold-press ball blanks at the rate of 18,000 an hr. Grinding operations before and after heat-treating and tempering "peel" from 4/1,000 to 8/1,000 of an in. at a time from the balls until they are reduced to the final size of 39/1,000 of an in. Nine distinct operations and about 190 machine hr are required to process a batch of a half-million balls.

## Outlines Policies For Disposal of Surpluses

Washington

••• Standard credit and collection policies have been outlined in detail by the WAA for its 33 regional offices which deal with surplus disposal.

In general, terms for sales on open account credit usually require payment in 30 days; federal agencies and other public groups are allowed 60 days.

Credit may be extended for certain types of durable items intended for business use and not for resale. In the case of raw materials, consumer goods, and cer-



## Safe on any surface

There's one metal cleaner that just doesn't fall down on the job. That's Wyandotte Metal Cleaner No. 38.

This *balanced* product can solve practically all the cleaning needs of the average plant with economy and efficiency.

Wyandotte Metal Cleaner No. 38 is all-soluble. It dissolves quickly, rinses easily and completely. It is designed to correct water conditions . . . wet rapidly . . . give long life in solution. It is inhibited to prevent corrosion of the metal being treated.

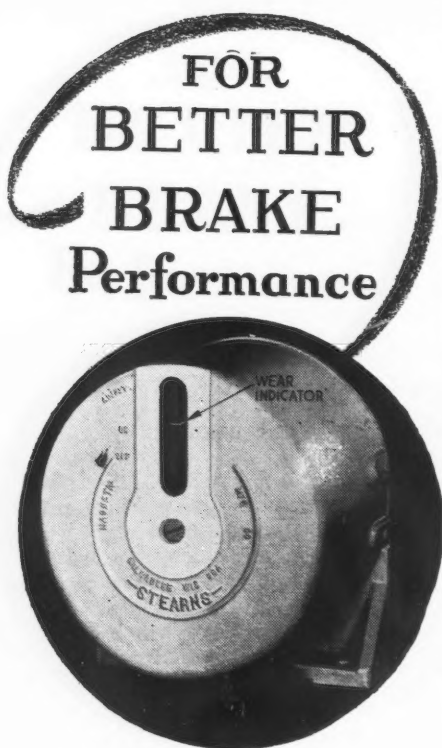
Wyandotte Metal Cleaner No. 38 is being used successfully for electro-cleaning of ferrous metals, as well as copper and brass.

It is a proven reverse current cleaner for zinc-base die-castings. It is giving satisfaction when used in electro-cleaning baths on hand-operated, semi- and full-automatic line . . . in still-cleaning solutions . . . in tumble barrel equipment . . . in pressure spray and rotary type metal parts washing machines.

Let your Wyandotte Representative tell you more about the advantages of Wyandotte Metal Cleaner No. 38. He's always at your service.



WYANDOTTE CHEMICALS CORPORATION • J. B. FORD DIVISION  
WYANDOTTE, MICHIGAN • SERVICE REPRESENTATIVES IN 88 CITIES



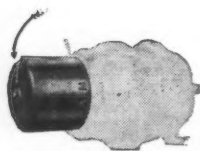
## STEARN'S MAGNETIC offers LARGER BRAKE for HEAVIER Loads

A Magnetic Disc Brake that will develop a torque of 575 lbs. or the equivalent of 100 HP at approximately 1000 RPM, now is available in the Stearns 1300 Series. It can be supplied in floor or motor mounting types for AC or DC current.

We can help you solve problems involving effective retarding of motors or machinery, whether for one or a sequence of controlled stops, whether for horizontal or vertical mountings.

Stearns Magnetic Disc Brakes are being used efficiently and satisfactorily by outstanding motor manufacturers and machinery makers in hundreds of exacting operations.

Consult Stearns Magnetic, Milwaukee 4, on your braking problems.



The magnetic brake with the lining wear indicator and manual release—distinctive, original.

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PULLEYS - DRUMS - CLUTCHES

### NEWS OF INDUSTRY

tain other property, credit may not be for terms longer than 3 yr. On other types of property, the maximum time is 5 yr.

The 3 and 5 yr periods are outside limitations and the credit period is usually shortened to conform to standard commercial practice. A standard interest rate of 4 pct has been adopted.

All applicants for credit must file formal applications, showing financial standing. Since ability to pay is the chief factor in determining credit extension, failure or refusal to file balance sheets automatically prohibits credit extension.

### *Raises Pig Tin Quotas For Milk Containers*

#### *Washington*

•••The Fluid Milk Shipping Containers' Industry Advisory Committee at a recent meeting was told by Arthur Manpin, chief of CPA's tin section, that approximately 1,250,000 lb of pig tin had been made available for the next 12 months under the present provisions of the tin order (M-43) to maintain the current production rate of 1.5 million milk shipping containers annually.

It was pointed out by CPA, however, that the availability of steel sheets may present a problem during the next two months because of the impact of the recent steel order (Direction 12 to M-21) which gives preference on steel mill schedules, during the third quarter to requirements for housing and farm machinery.

Emphasizing that milk production is of equal importance to that of other farm products, the Committee strongly urged that milk container producers also be allowed to obtain priority on steel mill schedules for their requirements. CPA representatives replied that the milk container supply appears to be adequate and that any expansion of the permitted priority list would flood the steel mills with priorities.

Representatives of the Office of International Trade, Dept. of Commerce, indicated that export requirements for bulk milk containers to meet the foreign relief program would be about 135,000 units, or approximately 8 pct of total production.

## PROTECT PARTS AGAINST RUST

*the new  
low-cost way with*

## OAKITE PROTECTIVE OIL

Drilled, machined, ground or sand-blasted parts that are marking time waiting further fabrication present perfect targets for attack by rust. Effective counter measures are called for here to reduce rust rejects... to insure that subsequent production proceeds in a smooth, trouble-free manner. You can get positive parts protection from rust by using that newly developed rust-preventive Oakite Special Protective Oil.

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Specially prepared 16-page booklet fully describes Oakite Special Protective Oil... offers many suggestions on a wide variety of useful applications such as protecting stored tools and parts from indoor rust; neutralizing fingerprints. Send for a FREE copy of the booklet or ask for an in-plant demonstration TODAY! No obligation.

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Principal Cities of the United States and Canada

**OAKITE** *Specialized*  
**CLEANING**

**MATERIALS • METHODS • SERVICE**

## Gallup Poll

[CONTINUED FROM PAGE 97]

corresponding rise in Republican strength is shown in the following table:

	Republican Vote	
	East Central Pct	West Central Pct
1932 Election .....	45	37
1936 Election .....	41	39
1940 Election .....	49	51
1944 Election .....	50	52
TODAY .....	56	56

The two sections have 155 electoral votes, or a little less than one third of the total for the country.

• • • Although the presidential chances of Harold E. Stassen for 1948 were given a boost by the outcome of the Minnesota primaries, he has nonetheless lost some Republican rank and file support throughout the nation as a whole in recent weeks.

Meanwhile, Gov. Thomas E. Dewey, of New York, has won new supporters among those preferring a Republican president in 1948.

Today's poll reveals the first interruption on the steady rise in popularity of the former Minnesota governor, who served in the U. S. Navy during World War II and was one of this nation's representatives at the San Francisco charter-forming conference of the United Nations.

The Dewey-Stassen rivalry thus shifts back to about the way it was in February, early this year. Dewey is top choice, as he was then, with Stassen running next among preferences, about ten points behind the New York governor.

In a poll taken this spring. Stassen and Dewey were running neck and neck, Dewey holding but one point advantage.

As in all such periodical measures of leaders in both parties as possible presidential material, the institute had field reporters ask voters:

"What man would you like to see elected president of the country in 1948?"

The standings today among Republican rank and file voters as compared to May:

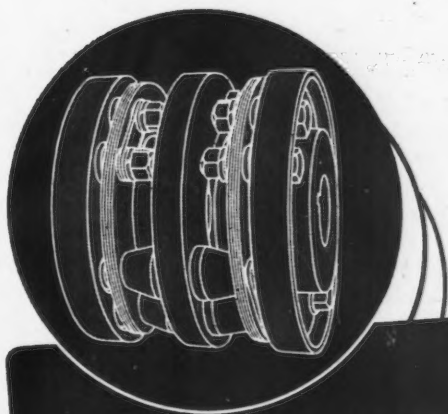
	May Pct	TODAY Pct
Dewey .....	35	38
Stassen .....	34	28

# THOMAS

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are specified by engineers wherever

100% dependability is demanded



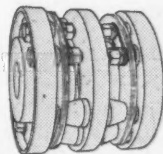
## THOMAS

### flexible COUPLINGS

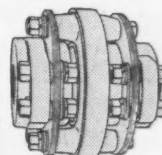
provide for  
Angular and Parallel  
Misalignment as well  
as Free End Float ...

and Eliminate  
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WEAR and CROSS-PULL**

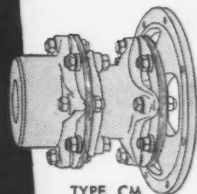
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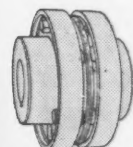
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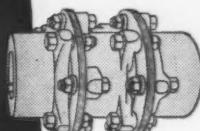
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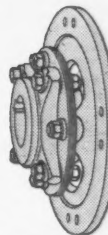
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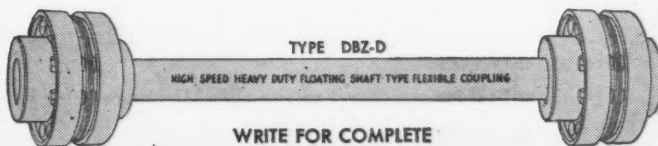
TYPE ST



TYPE AM



TYPE SS



TYPE DBZ-D

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WRITE FOR COMPLETE  
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WARREN, PENNSYLVANIA

Bricker	10	9
Vandenberg	5	7
MacArthur	5	6
Taft	3	4
Eisenhower	2	2
Others	6	6

Dewey's latest rise and Stassen's loss as shown above may be attributed in part to recent events. Stassen was not helped by the defeat of his candidate in the Nebraska primary. Moreover, two laws which Dewey put through the New York State Legislature have recently attracted nationwide attention: The first of these is the Ives-Quinn Bill creating a state fair employment practices commission which continues to operate while the Federal FEPC was allowed to die. The second is the New York State Rent Con-

trol Law, which immediately went into effect when the OPA came to a dramatic end two weeks ago.

The present poll does not, it should be noted, reflect voter reaction to the decisive victory of Stassen forces in Minnesota on Monday of this week.

The shifting tides of popularity of Dewey and Stassen are shown in the table below, giving the relative side of their popular following from May, 1945, until the present tie:

	Dewey Pct	Stassen Pct
May, 1945	59	15
Feb., 1946	38	27
April, 1946	37	33
May, 1946	35	34
TODAY	38	28

### Sharp Rise in Western European Coal Output

London

• • • Coal output in western European mines during May showed a sharp rise, although production in Western Germany is still well below half the prewar average. The European Coal Or-

ganization announces that in western Germany production of hard coal rose to 4,898,300 tons as against 4,447,300 in April. This figure is, however, only 40 pct of the prewar monthly average.

French output continues to rise, and in May it was 107 pct of the prewar monthly average, totaling 4,556,200 tons as against 4,448,400

in the previous month. Belgian production amounted to 2,073,500 tons which shows no change from the April figures and is 79 pct of the prewar monthly average. In the Netherlands production was 731,500 tons which is 60 pct of the prewar monthly average and a reduction of 36,300 on the April return; and in Italy (Sardinia) output rose to 99,000 tons, 8.7 pct of the 1940 monthly average.

In France, Belgium and the Netherlands there are more miners at work than in prewar days. Employment figures at June 1 were: Western Germany, 233,000 (April total 231,000); France, 318,000 (315,000); Belgium, 154,000 (156,000); Netherlands, 32,000 (33,000).

### London Economist

[CONTINUED FROM PAGE 105]

to \$107 billion could be regarded as ready purchase money in 1946. (This conservative consumer attitude, however, was evidenced in the first quarter of the year and would not necessarily apply if prices move sharply upward.)

The production of goods to meet this purchasing power, while still spotty, is coming along. The coal, steel and auto strikes cut deeply into the U. S. economy, more deeply than labor stoppages ever had before. Estimates of their total effects, direct and indirect, are bound to be hazy—some authorities hold that the steel and coal strikes cost the economy 12 million tons of steel this year, with shortages to be subsequently felt in such ubiquitous items as bearings. The cost in production of automobiles is easier to measure. Output for the three months January-March totaled 196,585 cars. For May it was 152,948. Average monthly production in 1941 was 405,000.

On the other hand, the Civilian Production Administration reports April production of vacuum cleaners, washing machines, gas ranges, gas water heaters and automobile tires as above the prewar high of 1940-41; during the first three weeks in June freight car loadings of manufactured goods of all types (seasonally adjusted) were 85 pct of the peak reached in March, 1945, when the war economy was going full blast.

The selective effect of the

## CHILLED SHOT DIAMOND GRIT

Airless or centrifugal operating machines require Heat-Treated Shot or Heat-Treated Steel Grit.

The ordinary Shot and Grit will not do. They break down too fast and wear away quickly. In other words—expensive at any price.

Our Shot and Grit were made expressly for use in airless machines.

It simply means—

More cleaning at much less cost.

More cleaning and less dust at less cost.

And, remember—any old size won't do.

There is a correct size of Shot and Grit to obtain maximum results.

If cleaning grey iron, malleable iron, or steel drop forgings, we can save you money.

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strikes is likewise indicated by the Census Bureau's figures on the overall labor force:

	Total Civilian Labor Force	Employed			Unem- ployed
		At Work	With a Job But Not At Work		
			Non- Agri- cultural	Agri- cultural	
	(000)	(000)	(000)	(000)	(000)
Jan.....	51,420	48,980	1,960	480	2,440
Feb.....	51,690	48,920	2,490	280	2,770
March....	52,950	50,790	2,010	150	2,160
April.....	54,550	52,420	1,950	180	2,130
May.....	55,320	53,310	1,830	180	2,010

In these tables strikers are listed as with a job but not at work, along with persons not at work because of illness, bad weather, vacation or temporary lay-off. The figures for unemployed may also include persons laid off or not taken on in other industries as an indirect result of strikes. The maximum man-month loss recorded thus far occurred in February; if 1,500,000 to 2,000,000 is regarded as a working minimum of unemployment, and 1,900,000 (outside agriculture) as a normal number with a job but not at work, the man-month loss in that month was between 3 and 4 pct of the available labor force. Nearly all of this loss can be attributed to the strike in steel.

If the current maneuvering on Capitol Hill ends in permanent abandonment of controls, and a severe U. S. price rise occurs, the consequences to Great Britain will, of course, be serious. The loan will buy less without costing less. And the inflationary psychology exhibited by Congress in relation to OPA does not forecast a favorable disposition toward such tariff reductions as the proposed International Trade Organization might suggest.

## New War Surplus Chief

Washington

• • • Twice winner of the Army's DSM for supplying the 3.2 million military forces in the European theater, Maj. Gen. Robert M. Littlejohn has taken over the job of supply-in-reverse — disposal of an estimated \$27.5 billion in war surpluses, about half of which consists of industrial property. He was sworn into office as War Assets Administrator on July 22.

## Improved Conditions In Foundries at Ford Motor Now Under Way

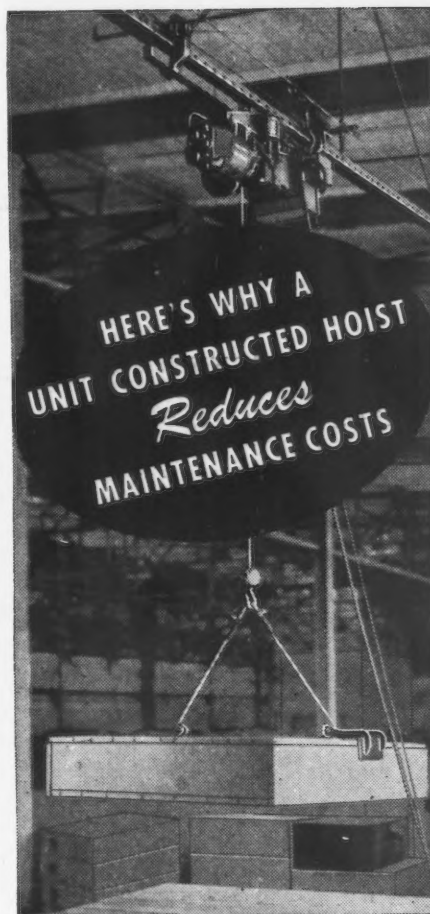
Detroit

• • • Everybody complains about the working conditions in foundries but the Ford Motor Co. is going to do something about it. A considerable portion of the \$10 million Ford Motor Co. foundry reconversion program, already well under way at the Rouge plant, will be spent to provide better working conditions for the company's 10,000 production foundry employees, according to an announcement by M. L. Bricker, vice-president in charge of manufacture.

The Ford production foundry is reported to be the largest in the world and was the first installation to employ conveyor lines, reversing conventional practice by carrying the molds to the men. At peak production Ford furnaces are able to melt 4 million lb of grey iron and steel castings daily which will meet the requirements of 5400 engine blocks and other castings.

The present Ford program calls for the removal of thousands of sq ft of balconies to provide improved ventilation and let in additional sun light. Several electric furnaces have been moved to an outside position in the building where objectionable heat and smoke will be virtually eliminated. Heat treat furnaces and welding booths, heretofore located on the first floor have been moved to the second, eliminating floor heat and improving ventilation.

Heavy hand work is being eliminated from many Ford operations. The charging platform, for instance, is being mechanized. Similar efforts are being made to improve the working conditions throughout the foundry. A new dust collector system has been installed to provide cleaner air and promote better health and efficiency. The installation of this advanced foundry equipment, it is said, not only eliminates much bulky equipment but simplifies many production tasks.



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*Reduces*  
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The hoisting unit in a Reading Electric Hoist has only four moving parts. The result is fewer wearing parts, fewer parts for you to overhaul or repair. Then too, each one of the four hoist units—suspension, motor, control and hoisting units, can be removed for maintenance purposes without the time-consuming "break-down" of any other unit.

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